# SCENARIO NOTE

## Toronto Waterfront Revitalization Initiative – Intergovernmental Steering Committee

## Meeting between the DM, INFC, DM MOI, Ontario, City Manager, Toronto, and Waterfront Toronto

| | | |
|---|---|---|
| **Date/Time:** | November 06, 2017, 2:30-4:00 | |
| **Location:** | City Hall 24E and by Video Conferencing | |
| **Subject:** | Intergovernmental Steering Committee between Infrastructure Canada, the Ontario Ministry of Infrastructure, the City of Toronto and Waterfront Toronto to discuss the Port Lands Flood Protection and Enabling Infrastructure Project and the Quayside Project. | |
| **Participants:** | **INFC**<br>Kelly Gillis – Deputy Minister<br>Marc Fortin (ADM)<br>Marie-Pier Nassif (Director – Ontario)<br>Roger Soler (Manager – Ontario)<br>Krishen Matharu (Analyst – Ontario)<br><br>**Ontario Ministry of Infrastructure**<br>George Zegarac (DM)<br>Elizabeth Doherty (Director) | **City of Toronto**<br>Peter Wallace (City Manager)<br>David Stonehouse (Director)<br><br>**Waterfront Toronto**<br>William Fleissig (CEO)<br>Marisa Piatelli (Chief Strategy Officer)<br>Edward Chalupka (Government Relations)<br>David Kusturin (Chief Project Officer)<br>Julius Gombos (Senior Project Director) |

**Departmental Objectives**

- To discuss next steps for the contribution agreement (CA) and the Tri-Governmental Implementation Accord ("the Accord") (formerly referred to as a Memorandum of Understanding) for the Port Lands Flood Protection (PLFP) Project. The Accord will lay out aspects of the government relationships not included in the more formal CA.

[redacted]

- To receive updates from WT on the Quayside Project.

[redacted]

**Stakeholder Objectives:**

- The City of Toronto will be updating the IGSC on its fall 2017 Staff Report to Council, which will focus on the PLFP Project.
- The Province & WT will provide updates on the First Nations Consultation process underway for lands located within the Project boundary.
- The City & Province will be reiterating the significance of receiving timely information from WT.

[redacted]

- WT will provide a status update on the Quayside project. A review of the Agreement Framework Summary is expected.



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**Context**

- The November 6 IGSC will provide a forum for the three levels of government to discuss the next steps required on the significant work remaining on the PLFP CA and Accord. Since Treasury Board approved the Project [redacted] a Tri-Governmental Working Group (TWG) (director and staff-level representation from the three governments) has been meeting regularly to advance the necessary components. To date, drafts of the CA and Accord are under development under the TWG, with participation from legal advisors and WT.
- This meeting will also provide an opportunity to review WT's legislated wind-up scheduled for 2023 and the possibility of an extension to 2028. WT has requested that governments begin exploring an extension beyond 2028 recognizing some commitments (e.g. long-term development of the Port Lands and Quayside) would run well past 2028.
- Finally, the November 6 IGSC comes on the heels of a recent announcement by WT for the Quayside Project and nomination of its preferred technology funding partner – Sidewalk Labs (SWL).

[redacted]

- A meeting agenda for the IGSC can be found in **Annex 1**. The last IGSC meeting was chaired by the City on September 25, 2017, minutes for which can be found in **Annex 2**.

**PLFP Contribution Agreement**

[redacted]

- By way of background, in June 2017, INFC undertook work to draft an individual, bi-lateral project CA for the PLFP with WT, with the Province and City following a similar approach.

[redacted]

**Update on City of Toronto Staff Report**

- The City is drafting a Fall report to City Council to seek authorization to advance WT funding for the PLFP and Toronto Waterfront Revitalization Initiative (TWRI). The funds are already approved, but a report is required to release the funding.



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[redacted]

**First Nations Consultation**

- The City will provide an update on PLFP First Nations Consultation activities [redacted]

[redacted]

- *INFC officials will continue to receive updates on this topic thorough the TWG and will provide input as required.*

**WT Update**

- WT will be presenting updates on its Quarterly Report and borrowing which are standing agenda items. To smooth out cash flows, governments have allowed WT to borrow against future revenues and there have been no issues to date. Supporting material can found in **Annex 4**.



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**Quayside**

- On October 16, 2017, [redacted] the WT Board endorsed the selection of Sidewalk Labs (SLW) as the Innovation and Funding Partner for the Quayside Project.
- SWL will provide $50M in operational support to WT during their yearlong design negotiations.
- The Quayside project will create a pilot project to test Smart City ideas and technology. A more detailed description of the Quayside project and timelines can be found in **Annex 5**.
- INFC is not funding this project, [redacted]
- In line with the point regarding WT's timely distribution of documentation, an Agreement Framework Summary for the Quayside project **(Annex 6)** was shared with government staff on November 1st, 2017. The summary outlines the framework for the agreement between WT and SWL, and while the final agreement is still under development, WT has suggested it will be ready for approval for the WT Board by the end of December.

[redacted]

- *Members at the IGSC may request more time to review the Summary and may express concern with the overall timeframe.*
- *INFC is monitoring the Quayside project through its position on the IGSC.*

[redacted]

**Points to Register**

*Project Contribution Agreements and Accord*

- INFC, in partnership with the Province and the City through the TWG, is committed to continuing work to develop the tri-party project CA and overarching tri-government implementation Accord.

*Mandate Extension*

- INFC is reviewing the *Toronto Waterfront Revitalization Corporation Act, 2002* to get greater insight on the wind-up clause and (default) 5-year mandate extension of the WT Corporation.

[redacted]

*Quayside*

- As non-funding partner on Quayside we have no comments. However, we would like to understand how these talks may implicate governments going forward.

*General Comments*

[redacted]



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*Next Steps*

- INFC will continue to develop its CA with government partners and WT and work towards the development of Accord with WT.

## Annexes

Annex 1: Agenda and Annotated Agenda
Annex 2: Minutes from the June 15, 2017 IGSC Meeting
Annex 3: [redacted]
Annex 4: WT Quarterly Report and borrowing
Annex 5: Quayside Project Summary
Annex 6: Agreement Framework Summary for the Quayside



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# IGSC Agenda
# November 6, 2017

City Hall 24E and by Video Conference
2:30 – 4:00 PM

1. Welcoming Remarks and Introductions – City (5 Min)

2. Approval of September 25, 2017 IGSC Minutes and Action Items – ALL (5 Min) – Decision Item
   - No issues to raise

3. Update on City of Toronto Staff Report – City (5 Min) – Information Item
   - The City is drafting a fall report to City Council to seek authorization to advance WT funding for the PLFP and Toronto Waterfront Revitalization Initiative (TWRI). The funds are already approved but a report is required to allow funds to flow. WT requires these funds to start work on the PLFP until the CA can be signed.

4. Contribution Agreement(s) for Port Lands Flood Protection – ALL (15 Min) – Discussion Item
   - The three levels of government recently agreed to pursue a single tri-party CA.
   - Canada is leading on this. We are targeting signature by end of Q1 2018; the Province will have to seek TB approval and the City will have to seek Council approval of the agreed to CA.
   - The WT Board cannot approve major expenditures until the CA is signed.

5. Tri-Government Implementation Accord – TWG (10 Min) – Discussion Item
   - The Accord will outline the shared, long-term governance roles and responsibilities for each signatory for the broader Toronto Waterfront Revitalization Initiative (TWRI). The Accord will ensure appropriate oversight of WT expenditures and planning through governance of the broader TWRI.

6. WT Request for Mandate Extension to 2028 – WT – (5 Min) Discussion Item
   - INFC is reviewing the *Toronto Waterfront Revitalization Corporation Act, 2002* to get greater insight on the wind-up clause and (default) 5-year mandate extension of the WT Corporation.

[redacted]

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# IGSC Agenda
# November 6, 2017

City Hall 24E and by Video Conference
2:30 – 4:00 PM

7. Update on Quayside – WT (15 Min) – Information Item
   - On October 16, 2017, [redacted] the WT Board endorsed the selection of Sidewalk Labs (SWL) as the Innovation and Funding Partner for the Quayside Project.
   - SWL will provide $50M in operational support to WT during their yearlong design negotiations.
   - The Quayside project will test Smart City ideas and technology.

[redacted]

   - As non-funding partner on Quayside we have no comments. However, we would like to understand how these talks may implicate governments going forward.
8. Update on First Nations Consultation – ALL (5 Min)
   - The City will provide an update on PLFP First Nations Consultation activities [redacted]

[redacted]

9. WT Update – WT (10 Min) – Information Item

(i) Quarterly Financial Report

(ii) Borrowing

(iii) Annual Plan

   - WT is permitted by funding partners to take on short-term debt off-set by longer-term revenues to smooth operating cash flows.
   - It has historically demonstrated responsible behavior when taking on debt.
   - We have no concerns at this time.

10. In Camera (If necessary) – (15 Min)

[redacted]

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**Toronto Waterfront Revitalization Initiative**
**Intergovernmental Steering Committee**
**Meeting Minutes**

Monday September 25, 2017
10:30 to 11:30 AM

| | |
|---|---|
| Federal Representatives: | Marc Fortin, Chad Westmacott, Krishen Matharu |
| Provincial Representatives: | George Zegarac, Bruce Singbush, Trevor Bingler, Carol Mercer |
| City of Toronto Representatives: | John Livey (chair), David Stonehouse, Leah Ross, Brett Howell |
| Waterfront Toronto Representatives: | William Fleissig, David Kusturin, Lisa Taylor, Marisa Piattelli, Ed Chalupka |

| | ITEMS DISCUSSED | |
|---|---|---|
| 1. | Welcome and Introductions | John Livey welcomed all IGSC members to the meeting and highlighted the $1.185 Billion funding announcement that was made on June 28th, 2017. |
| 2. | Approval of June 2017 IGSC Meeting Minutes | IGSC minutes were approved with a minor change to Item 7 to note that Meg Davis provided the Quayside Update instead of Marisa Piattelli. |
| 3. | Port Lands Flood Protection and Cherry Street Lakefilling Project Update<br>(i) Contribution Agreements | (i) David Kusturin provided a verbal update. A payment strategy has been identified with the government partners which sees the City/Province being invoiced before expenses are incurred (Advanced Payment) and the Federal government contributing after expenses are paid (Reconciliation Invoice). The Advanced Payment and Reconciliation Invoices would be prepared on a quarterly basis and would be certified based on standard industry practices.<br>As part of the CA discussion, TWG members identified a series of questions for WT to address. WT will complete these answers; sub-project details will be coming once the Construction Manager has provided input into scheduling (6 to 9 months).<br>It was also noted that the City is looking to optimize its DC recoveries. This will not have an impact on the government cash flows because there is ample room within each calendar year to accommodate the City's preferred allocation of expenses. The City will draft a memo on this. |



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| | | The Federal government has started drafting their CA and the City is in the process of writing a term sheet. |
| | (ii) Project Update | (ii) For the Cherry Street Lakefilling Project approvals have been secured from the Department of Fisheries and Oceans. [redacted] |
| | | The Construction Manager for Cherry Street and larger Flood Protection project is Ellis Don. For the Cherry Street portion the Construction Manager will be mobilized and onsite within a month.<br><br>WT's Board has approved $15M of schematic design work for Flood Protection. Many of the Due Diligence consultants have been retained for Flood Protection implementation. Design work will be fully underway within a few weeks. |
| | (iii) First Nations Consultation | [redacted] |
| | (iv) Fall Report to Council | (iv) City's Waterfront Secretariat will be reporting to Executive Committee at the end of November. The report will include the terms for the City's CA. The preliminary draft report will be shared with the government partners the third week of October and again at the beginning of November. The report will focus on Flood Protection but it will be contextualized within Waterfront 2.0. The report will also discuss WT governance, the Port Lands Business and Implementation Plan framework, and next steps. A portion of the report will also be dedicated to responding to residual requests around the role of the Waterfront Secretariat and the results of the recent audit. |
| 4. | Waterfront Revitalization Governance Updates | The updated Terms of Reference for the IGSC and ESC were approved. |



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|---|---|---|
| | (i) IGSC Terms of Reference<br><br>(ii) ESC Terms of Reference | |
| 5. | WT Update<br>(i) Quarterly Financial Report<br>(ii) Borrowing<br><br>(iii) 2017/18 Corporate Plan Amendment<br><br><br><br><br><br>(iv) Quayside | (ii) Cash flow change to reflect the timing of Bayside land sales revenues from March to May. No risk associated with the timing change.<br>The new ERP system will integrate within WT's existing Microsoft platform and was approved by WT's Board last meeting.<br><br>(iii) Was reviewed by the WT Board on September 14, 2017. WT has identified gaps in their current staff complement. WT is preparing a write-up on how staffing needs fit within their 5-year timelines.<br>Flexible approach to staffing (i.e. contracts) for positions that require specialized skillsets and where there is a limited quantity of potential candidates. WT may create a separate, independent, capital risk panel with experience managing major capital projects.<br><br>(iv) Preferred proponent has been identified. Currently in negotiations and should conclude within weeks. A framework agreement will then be circulated to the government partners. Stage 1 of the work program will be funded by capital from the preferred proponent. Quayside will feature several stage gates with off ramps.<br>A portion of Quayside is owned by WT and the remainder is owned by the City and another private party. |
| 6. | Other Business<br>(i) Waterfront Toronto<br>(ii) Federal Government<br>(iii) Provincial Government<br>(iv) City of Toronto | (i) WT sought clarification as to what the process is for the 5-year renewal of its mandate (to 2028). It was determined that a review should be undertaken to fulfil the requirements of the TWRC Act; previous audits of WT could not solely be relied upon as the review.<br>[redacted] |
| 7. | In-Camera Session | No in-camera session was requested and the meeting was adjourned. |



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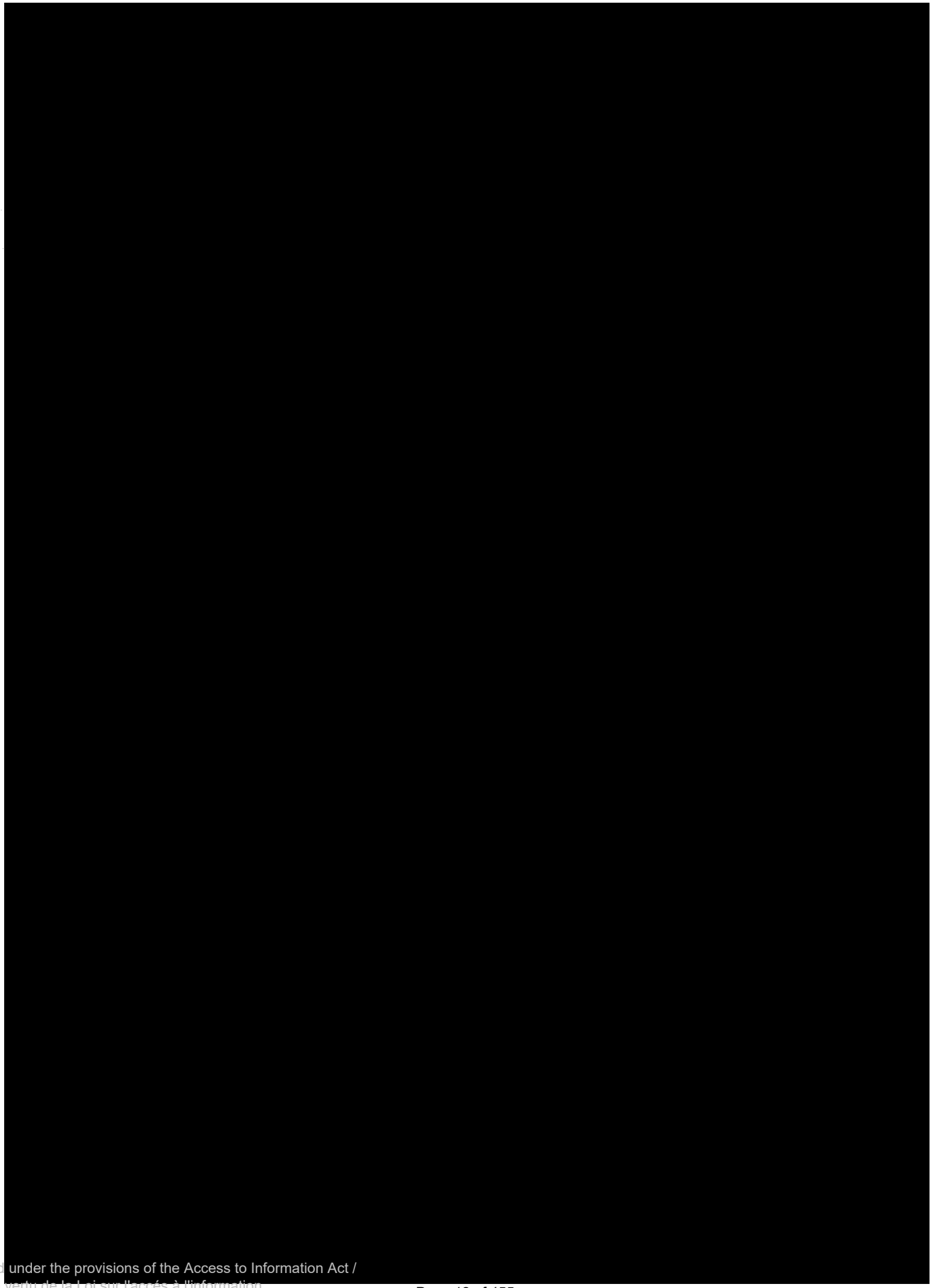
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# Waterfront Toronto Financial Update

Inter-Governmental Steering Committee Meeting

January 25, 2018

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# Agenda

WATERFRONTtoronto

- Quarterly Financial Report: 2017/18 Corporate Plan Performance
- Borrowing Update
- 2018/19 Corporate Plan
- Enterprise Resource Planning (ERP) Update
- Appointment of Enterprise Risk Advisor and Internal Auditor
- New Policy – Financial Instruments



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ATIA - 20(1)(b)
ATIA - 20(1)(c)
ATIA - 20(1)(d)

# 2017/18 Corporate Plan Performance

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The Corporate Plan is monitored and formally reported to Waterfront Toronto's Finance, Audit and Risk Management Committee (FARM) and Board on a quarterly basis.

The most recent update summarized below was provided to FARM on Nov 30, 2017 and to the Board on Dec 7, 2017 :

1. **Key Deliverables** - Overall the Corporation is set to achieve **90%** (19 out of 21) key deliverables as per the approved 2017/18 Corporate Plan amendment.
   - The two deliverables we will not achieve, namely the Stormwater Management facility (redesign required to accommodate pending realignment of Gardiner Expressway), and a land acquisition [redacted] have been deferred until FY 2018/19.
2. **Budget** - Overall the Corporation is forecasting an investment of **93%** of its total 2017/18 Capital Investment Plan ($150.2 million vs. $ 162.3 million). The decrease of $12.1 million is attributed to:
   - Deferral of land acquisition [redacted] and construction tender for the Stormwater management facility project, aggregating $18 million which is partly offset by;
   - An increase in Gardiner Environmental Assessment project expenditures to accommodate the additional public realm design work requested by the City of Toronto.
3. **Revenues** - Overall the Corporation is forecasting to realize **107%** of planned 2017/18 ($93.4 million vs. $87 million per amended Corporate Plan). The favorable variance of $6.4M is primarily as a result of:
   - Increase in project funding schedule from the governments for Port Lands Flood Protection & Enabling Infrastructure implementation project; and
   - Additional City contributions due to increased scope for the Gardiner Environmental Assessment project (public realm).



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ATIA - 20(1)(b)
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ATIA - 20(1)(d)

# Borrowing Update

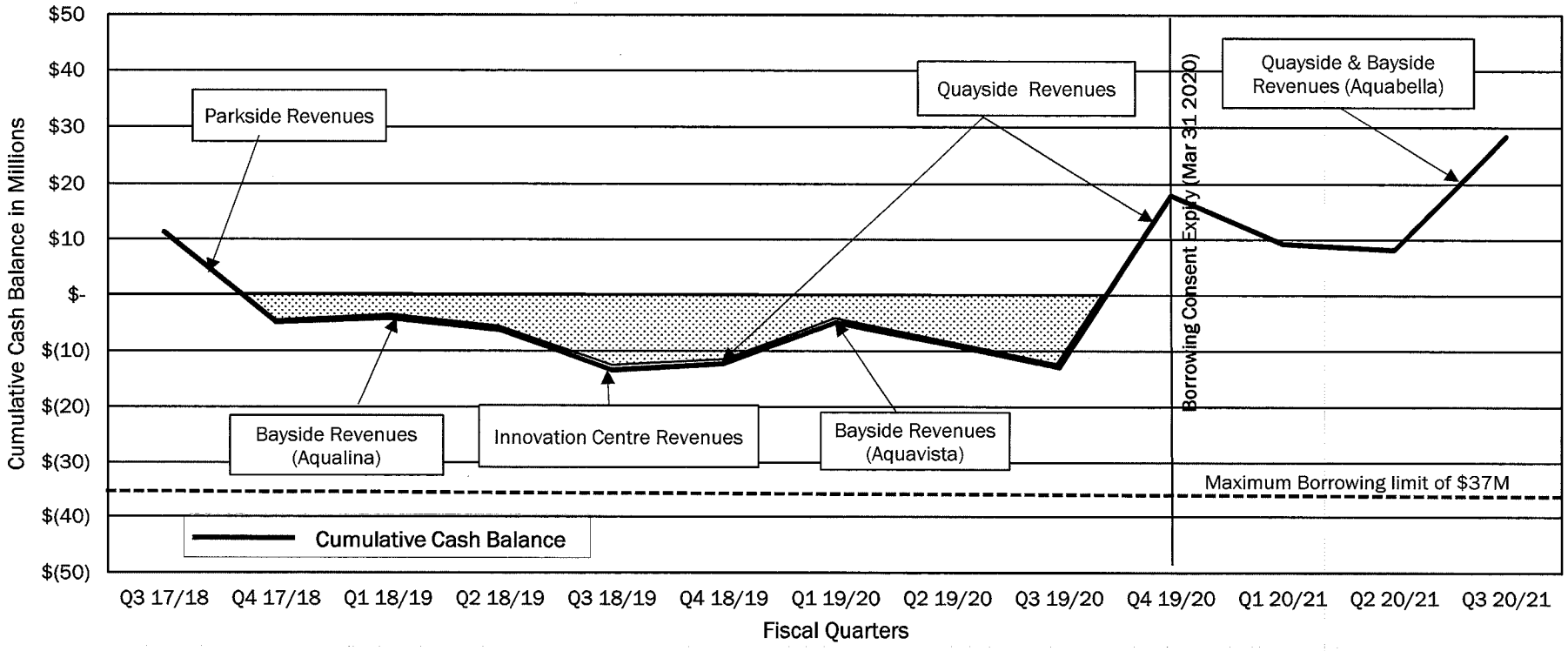
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- As per the 2015 five year Government Borrowing Consent which expires on March 31, 2020, Waterfront Toronto has authority borrow up to $40 million, secured against Quayside lands.
- In June 2017 Waterfront Toronto issued a letter of credit for approximately $3 million to the Department of Fisheries and Oceans for the Cherry Street Stormwater and Lakefilling project, reducing available borrowing to $37 million.
- **Waterfront Toronto's borrowing requirement for Q4 2017/18 has reduced by $12 million to $4.8 million due to the deferral of a planned land acquisition** [redacted]
- Our next forecast borrowing period begins March 2018 at $4.8 million, peaks in December 2018 at $13.4 million, then fluctuates until March 2020 at which time it is anticipated to be fully repaid.
- The key borrowing dependent projects include:
  a. Land acquisition [redacted] and
  b. Stormwater management facility.
- Cash inflows expected to be realized during FY 18/19 to FY 19/20 to repay borrowing aggregate $120 million and are primarily made up of the following land related revenues for Bayside, Dockside and Quayside.
- Any delay in the expected timing of realization of these revenues could result in an extended borrowing period and a need to extend the existing borrowing consent beyond March 2020.



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## Cash Flow Forecast October 2017 to December 2021




| In $ Millions | Q3 17/18 | Q4 17/18 | Q1 18/19 | Q2 18/19 | Q3 18/19 | Q4 18/19 | Q1 19/20 | Q2 19/20 | Q3 19/20 | Q4 19/20 | Q1 20/21 | Q2 20/21 | Q3 20/21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash Inflow | 7.1 | 16.1 | 23.7 | 4.7 | 13.7 | 23.8 | 15.5 | 2.1 | 1.9 | 35.7 | 1.3 | 2.2 | 47.1 |
| Cash Outflow | 30.0 | 32.2 | 22.9 | 6.8 | 20.9 | 22.7 | 8.1 | 6.0 | 6.0 | 4.9 | 10.0 | 3.2 | 26.8 |
| Net Cash Change | (22.9) | (16.1) | 0.7 | (2.1) | (7.2) | 1.1 | 7.4 | (3.9) | (4.1) | 30.8 | (8.7) | (1.1) | 20.2 |
| Balance | 11.3 | (4.8) | (4.1) | (6.2) | (13.4) | (12.3) | (4.9) | (8.8) | (12.9) | 17.9 | 9.2 | 8.2 | 28.4 |

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# 2018/19 Corporate Plan

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- Waterfront Toronto's 2018/19 Corporate Plan approved by the Board December 7, 2017.
- Overall this plan continues to strengthen our capacity and resiliency by adding the staff, tools and resources to ensure we can deliver on our strategic priorities.
- The plan comprises four sections: Vision; Our Priority Projects; Financials and Capacity to Deliver; and Appendices.
- The total financial impact of the Corporate Plan is a capital investment of $325 million of which the Port Lands accounts for 77%. The Plan is funded by 96% government and other revenues, and 4% borrowing.
- The key priority areas highlighted in the Corporate Plan include:
  - Start of construction on the Port Lands Flood Protection project,
  - Continuing implementation of complete communities in East Bayfront and West Don Lands, Public places along the waterfront and Eastern Waterfront Transit planning initiatives,
  - Building successful partnership with Sidewalk Labs including the roadmap for the development of the Master Innovation and Development Plan.
- The Corporate Operating budget increased $4.9 million to $18.8 million, largely to build additional capacity in HR resources (total staff complement of 99) to deliver on the Corporation's strategic objectives.



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# Enterprise Resource Planning (ERP) Update

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- The implementation of D365 is a key component of the Corporation's Organizational Resiliency Plan included in its 2017/18 Corporate Plan Amendment (total budget $0.7 million), as it is expected to significantly enhance operational effectiveness, transparency and accountability given our existing ERP system has reached end of life.
- The implementation, which began in September, 2017, is being jointly led by a third party System Integrator (Thinkmax Consulting) together with a contracted ERP Business Transformation Senior Manager (Emil Zelic).
- Current phase: Design Configuration (Analysis phase completed).
- **Subject to resolving some resource and budget issues, Waterfront Toronto's implementation of Microsoft Dynamics 365 (D365) is underway and on track to go-live in June, 2018 (previously April, 2018).**
- A detailed project work plan has been developed with key milestones and risk factors.
- The key risk factors actively being managed include:
  - Project workload demands on internal resources;
  - Complexity of changes to business work flows;
  - Migration of existing data and reporting.
- An organizational change management plan and a communications plan have been developed and are being implemented.



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# Appointment of Enterprise Risk Advisor and Internal Auditor

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- Waterfront Toronto's Board of Directors approved the appointment of **MNP LLP** (MNP) as the Corporation's Enterprise Risk Advisor and Internal Auditor at its meeting on Dec 7, 2017.
- MNP was the successful proponent in a competitive procurement involving firms that are a part of the Waterfront Toronto's Risk, Governance & Controls Advisory Services.
- The scope of MNP's role is as follows:
  1. Peer review Waterfront Toronto's enterprise-wide risk register and develop a two-year internal audit plan (FY 2017/18);
  2. Implement the two-year risk-based internal audit plan (FY 2018/19 and 2019/20).



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# New Policy – Financial Instruments

WATERFRONTToronto

- Waterfront Toronto's Board of Directors approved a **Financial Instruments Policy** on December 7, 2017
- The Financial Instruments Policy provides policy guidelines as to key principles, as well as the acceptable and appropriate hedging strategies the Corporation could engage to mitigate currency risk.
- The proposed policy strengthens the Corporation's risk management toolkit with respect to exposure to currency risk.
- Historically currency risk has not been a significant risk for Waterfront Toronto. In the majority of cases, contracts are procured and established in Canadian dollars.
- The Corporation now has at least one major foreign vendor for which it is more prudent and cost effective for Waterfront Toronto to manage the associated currency risk directly.
- The approvals and authorization levels in this policy will be incorporated into the Corporation's Delegations of Authority (Board approved June 13, 2017), which establishes management approval thresholds and execution authorities in accordance with By-Law No. 1



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# Waterfront Toronto: Innovation and Funding Partner for the Quayside Project

***Background:***

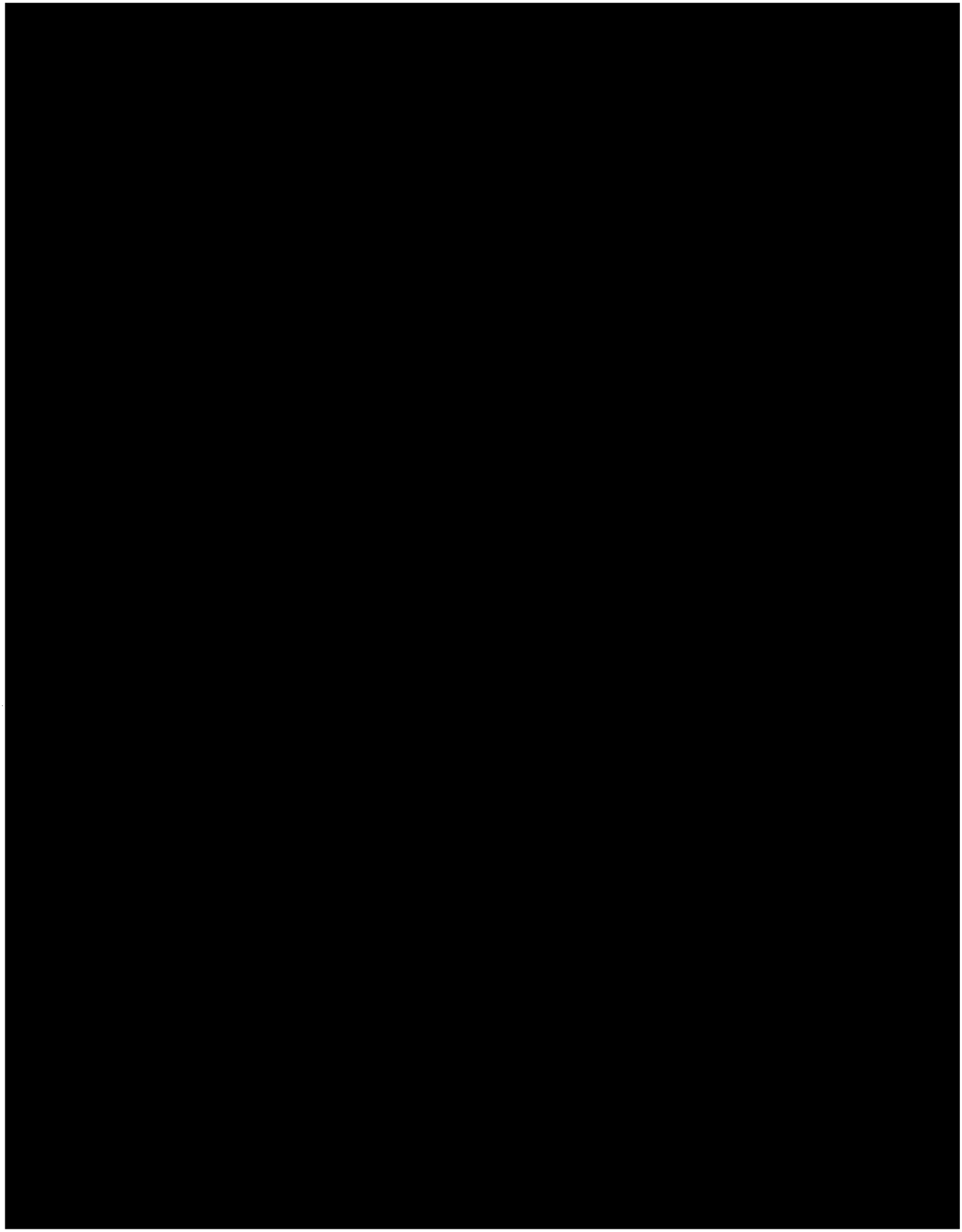
- Quayside is a 12-acre development site situated along Toronto's eastern waterfront.
- It comprises sites owned primarily by Waterfront Toronto (WT) and the City of Toronto, as well as a privately-held parcel.
- Quayside offers approximately 3.3 million square feet of development potential.
- Typically, WT retains a constructor to build what has already been defined. With Quayside, the intent is to pick an Innovation and Funding Partner (IFP) who will help to create, realize and fund a vision for sustainable urban development on Toronto's eastern waterfront.
- This partner will work with WT to advance a technology plan and establish a "smart city" [redacted] which will include mixed residential, commercial and retail development. In essence, the Quayside precinct would serve as a test-bed for technology and innovation.
- [redacted]

***Selection of Innovation and Funding Partner (IFP)***

- On August 22, 2017, WT received the Best and Final Offer Submissions after going through an exhaustive and robust selection process of prospective IFP proposals which closed on April 27, 2017.
- Based on the results, the RFP Evaluation Team recommended, and the steering committee subsequently approved, that Sidewalk Labs – a subsidiary of Alphabet and sister company of Google – be formally selected as the preferred proponent to move forward into negotiations as Waterfront Toronto's Innovation and Funding Partner for the Quayside Project.
- Subsequent to this, on October 16, 2017, the Waterfront Toronto Board of Directors endorsed the selection of Sidewalk Labs LLC as the preferred proponent to move forward as the Innovation and Funding Partner for the Quayside Project.
- An announcement of the preferred partner was made with participation from the Prime Minister and Side Walk Labs CEO, Daniel Doctoroff, on October 17, 2017.

[redacted]

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**November 1st, 2017**

# Innovation and Funding Partner Framework Agreement
# Summary of Key Terms
# For Public Disclosure

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## Overview

As a result of Waterfront Toronto's Request for Proposals No. 2017-13, Waterfront Toronto has selected Sidewalk Labs as its Innovation and Funding Partner to work jointly on plan for a new kind of district on Toronto's Eastern Waterfront – one that will combine forward-thinking urban design and new digital technology to achieve precedent-setting levels of sustainability, affordability, mobility and economic opportunity. The Framework Agreement entered into by Waterfront Toronto and Sidewalk Labs sets forth the basic terms and fundamental principles to guide that working relationship. It contemplates an initial joint planning process, which Sidewalk Labs will commit up to US$50 million to fund, that will occur over the next 12 months. The result of that planning process is expected to be a Master Innovation and Development Plan (MIDP), which if approved by the Boards of Directors of Sidewalk Labs and Waterfront Toronto, and with applicable government approvals, will be followed by a long-term joint effort to realize the shared vision.

The Framework Agreement contemplates a collaborative relationship in the creation of the MIDP, which will outline how to achieve this new kind of district on Quayside and the Eastern Waterfront, and which will be informed by meaningful public engagement. The governance of this relationship includes a Project Management Committee that consists of an equal number of senior representatives of Sidewalk Labs and Waterfront Toronto, including their respective CEOs. The governance relationship between the parties will be elaborated in future agreements between the parties.

The Framework Agreement also contemplates that:

- Sidewalk Labs will facilitate the commitment from Alphabet Inc. to move Google's Canadian headquarters to provide an initial anchor tenant to the waterfront, subject to the MIDP.
- Sidewalk Labs and Waterfront Toronto will seek to incorporate into the MIDP innovative approaches for financing affordable housing which are expected to meet or exceed the affordable housing commitments already made by Waterfront Toronto on Quayside.
- The parties will work to incorporate the establishment of an Urban Innovation Institute in the MIDP as a secondary anchor tenant for the site.

While the Framework Agreement outlines guiding principles for the parties' relationship, many of the details will be further defined through additional discussions and future agreements as the partnership progresses over the course of the next year. This incremental planning process was designed to recognize the complexity of the endeavor, the necessity of extensive stakeholder and community engagement, and the need to incorporate feedback as the plan takes shape. Accordingly, Sidewalk Lab's capital commitments for the planning process correspond to stages of collaboration, with expenditures incrementally increasing as the parties' shared vision and integration grows.

More specifically, the Framework Agreement provides for the funding of up to US$10 million by Sidewalk Labs prior to the achievement of certain "initial plan milestones," and the funding of up to an additional US$40 million by Sidewalk Labs between the achievement of those initial plan milestones and the approval of the MIDP. The initial plan milestones that trigger the incremental US$40 million commitment are:

- execution of contribution agreements representing governments' commitment of CAN$1.25 billion to complete the Port Lands flood protection;
- re-affirmation of Waterfront Toronto's existing mandate for the planning and development of the Eastern Waterfront;

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- alignment of the parties on the scope of a Business and Implementation Plan as required by City Council;
- alignment of the parties on the scope of the MIDP; and
- agreement by Waterfront Toronto and Sidewalk Labs on fair and arms'-length procurement standards for any future procurements.

The Framework Agreement permits either party to terminate the agreement in certain circumstances, including if the initial plan milestones are not achieved within approximately six months, or if the MIDP is not approved within approximately 12 months. Waterfront Toronto also has a unilateral right to terminate the agreement prior to the completion of stage 1. The Framework Agreement does not itself provide any rights in land or any rights to develop land.

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## Parties

The signatories are (1) Toronto Waterfront Revitalization Corporation ("Waterfront Toronto"), (2) Sidewalk Labs LLC (together with its affiliates "Sidewalk" or "Sidewalk Labs") and (3) Sidewalk Toronto, Limited Partnership, which will be the entity through which Waterfront Toronto and Sidewalk will collaborate to create the MIDP for Quayside and the Eastern Waterfront.

## MIDP and Collaboration on the MIDP

When the planning work contemplated in the Framework Agreement is completed, the result will be a Master Innovation and Development Plan (MIDP), which will be a comprehensive plan for the urban design, technology, infrastructure, and strategies needed to achieve the parties' vision for sustainability, affordability, mobility, and economic development for Quayside and the Eastern Waterfront. The parties also plan to continue to develop a thoughtful "Privacy by Design" policy to be incorporated into the MIDP, which will ensure compliance with applicable privacy laws and take into account community input.

Waterfront Toronto and Sidewalk Labs commit to collaborate with one another in good faith to jointly develop the MIDP within the timeframes contemplated by the Framework Agreement.

Any subsequent implementation of the MIDP is subject to the parties' mutual approval of such MIDP. This includes approval of the MIDP by Waterfront Toronto's Board of Directors

## Site

The Framework Agreement itself does not commit any lands for development - only to conceive an innovative plan for urban design, technology, infrastructure, and strategies to achieve the parties' vision for sustainability, affordability, mobility, and economic opportunity. For the purposes of that planning work, there will be two sites included in the planning work of the MIDP: (i) Quayside which is the area bounded by Lakeshore Boulevard on the north, Bonnycastle Street on the west, Queens Quay Boulevard and its future extension to the south, and including 333 Lake Shore Boulevard East on the east and any developable lands created by any road realigned within the Quayside boundaries, and excluding any lands not publicly owned; and (ii) the Eastern Waterfront which is the area bounded by the Inner Harbour on the west, Keating Channel and Lake Shore Boulevard to the north, Lake Ontario to the south, and Leslie Street to the east. See map attached.

Quayside is the site on which the parties expect to first pilot the technologies and strategies included in the MIDP.

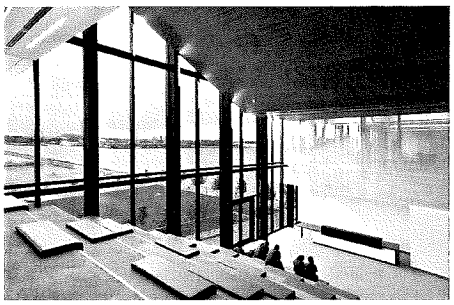
## Stages

The Framework Agreement contemplates four planning stages:

Stage 0: This stage began with Waterfront Toronto's selection through a competitive RFP process of Sidewalk Labs as its selected Proponent, and included contract negotiations and the development of the Framework Agreement. This stage ended with the execution of the Framework Agreement on October 16, 2017.

Stage 1: Started upon signing the Framework Agreement and will end with the satisfaction of the following three conditions (1) the signing of a Plan Development Agreement to provide a work plan for

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creating the MIDP, (2) agreement on a Development Plan Budget for anticipated expenses during stages 1-3, and (3) agreement on a methodology for the valuation of any future transfers of land.

Stage 2: Starts at the end of stage 1 and ends upon the achievement of the initial plan milestones as set out above. These are targeted to be completed by the Spring, 2018.

Stage 3: Starts at the end of stage 2 and ends upon finalization and approval or rejection of the MIDP which will require Board approval of both Sidewalk Labs and Waterfront Toronto. If the MIDP is approved, an Implementation Agreement and Collaboration Agreement, and perhaps other agreements, will then be executed by the parties to govern the longer-term relationship and implementation of the MIDP. This stage is targeted to be completed by Fall, 2018.

### Government Approvals

The implementation of the MIDP will require that the parties first obtain all necessary approvals from the City of Toronto, the Province of Ontario, the Canadian federal government, and other agencies or entities as required. The agreement by Waterfront Toronto and Sidewalk Labs on the MIDP will not itself result in the grant of any such approvals.

### Capital Commitments

As described above, Sidewalk will provide a capital commitment of up to US$50 million to fund the creation of the MIDP.

### Fair Procurement Standards

As noted above, one of the initial plan milestones is the parties' agreement on fair and arms'-length procurement standards that are consistent with Waterfront Toronto's principles of openness and fairness in procurement.

### Google Canadian Headquarters

In the Framework Agreement, Sidewalk agrees to facilitate the commitment from Alphabet Inc. to move Google's Canadian headquarters to the waterfront to provide an initial anchor tenant, subject to the MIDP.

### Local Venture Investments

The Framework Agreement also contemplates that the parties will seek to source investment opportunities in innovative Canadian companies.

### Affordable Housing Trust

The Framework Agreement provides that Waterfront Toronto and Sidewalk will seek to incorporate into the MIDP innovative approaches for financing affordable housing.

### Urban Innovation Institute

The Framework Agreement also provides that the parties will work to incorporate the establishment of an Urban Innovation Institute in the MIDP as a secondary anchor tenant for the site.

### Economics

The Framework Agreement contemplates agreement of the parties on a Development Plan Budget for the anticipated expenses of the project.

### Development

The selection of Sidewalk as the successful proponent under Waterfront Toronto's Request for Proposals 2017-13 has resulted in the selection of a partner to develop a plan that will combine forward-thinking urban design and new digital technology to achieve precedent-setting levels of sustainability, affordability, mobility and economic opportunity as will be set out in the MIDP. Request for Proposals 2017-13 did not result in the selection

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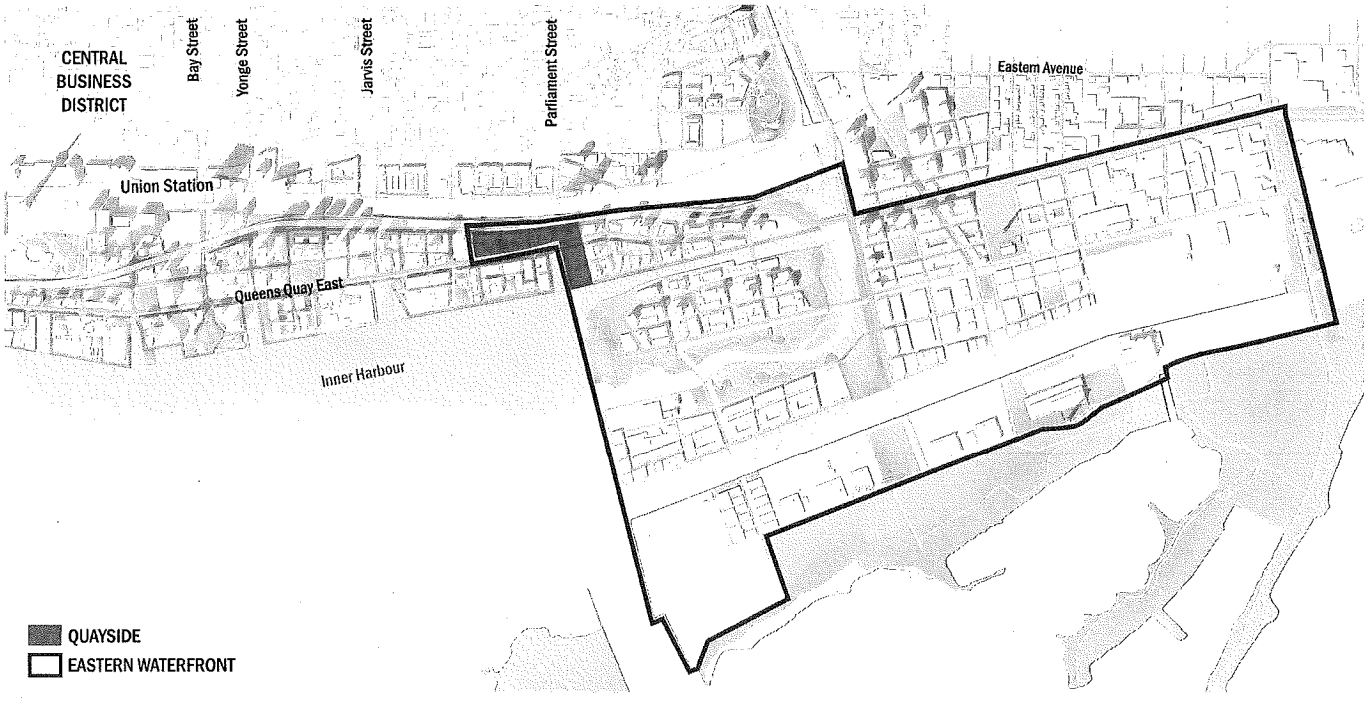
of a development partner for the development of individual parcels of land. Rather the MIDP will provide an overlay plan of infrastructure and strategies to achieve the shared vision of Sidewalk and Waterfront Toronto that will be imposed on developers when they are selected in the future to develop the lands. The way in which the infrastructure and technologies will actually be delivered and financed (including legal structures) has not been determined at this time and will be given further definition in the MIDP.

## Public Engagement

The planning work contemplated by the Framework Agreement that will result in the MIDP will be developed with robust consultation based on questions, concerns and ideas generated from open and transparent public engagement that has been the high standard of all of Waterfront Toronto's work to date.

## Non-Disclosure of the Framework Agreement

The Framework Agreement contains a requirement that it be kept confidential. However, in the interest of transparency, the Waterfront Toronto and Sidewalk Labs' have agreed, to release this summary while the they continue to work together to address commercial terms during Stage 1.






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Infrastructure Canada

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## SCENARIO NOTE

### Meeting between the Deputy Minister of Infrastructure and Communities and the Chief Executive Officer of Waterfront Toronto

| | |
|---|---|
| **Date/Time:** | Tuesday, December 19, 2017, 10:00 AM to 12:00 PM |
| **Location:** | 427 Laurier, 10th Floor, Deputy Minister's Boardroom |
| **Subject:** | Update on the Waterfront Toronto (WT) Port Lands Flood Protection project and the Quayside project including the details of the Framework Agreement between WT and Sidewalk Labs. |
| **Participants:** | **Infrastructure Canada**<br>• Kelly Gillis, Deputy Minister of Infrastructure and Communities<br>• Mike Burton, Director of Parliamentary Affairs<br>• Marc Fortin, Assistant Deputy Minister, Program Operations Branch<br>• Zahira Sookhdeo, Senior Counsel, Transports and Infrastructure Canada<br>• Marie-Pier Nassif, Director, Ontario Region<br><br>**Waterfront Toronto**<br><br>**In person:**<br>• William Fleissig, Chief Executive Officer of Waterfront Toronto<br>• Marisa Piatelli, Chief Strategy Officer<br>• Edward Chalupka, Director, Government Relations<br><br>**By Video Conference:**<br>**WT Internal**<br>• Meg Davis, Chief Development Officer<br>• Erik Cunnington, Director, Development<br>• Ian Beverley, Legal Counsel<br>**External Legal**<br>[redacted]<br><br>**Note:** Biographies available in **Annex A**. |

**Departmental Objectives**

- To brief you on the history of Waterfront Toronto (WT) and provide a status update on their current work on the Port Lands Flood Protection (PLFP) and the Quayside projects. A deck will be presented by WT; a copy of the presentation is attached **(Annex B)**.

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- Discuss the details of the attached Framework Agreement (FA) recently entered into between WT and Sidewalk Labs (SWL) **(Annex C)**. The FA companion document is a covering memo [redacted] **(Annex D)**.

**Stakeholder Objectives**

- Waterfront Toronto will provide an overview of the FA for the development of Quayside.

[redacted]

**Context/Overview**

- The Quayside project aims at creating the world's first Smart City, planned and executed at scale "from the internet up" including innovations in: mobility and transportation; building forms and construction techniques; core infrastructure development and operations; social service delivery; environmental efficiency and carbon neutrality; climate mitigation strategies; optimization of open space; data-driven decision making; governance and citizen participation; and regulatory and policy innovation.

- The October 16, 2017 FA indicates that the Quayside development, which is to take place on a 12-acre plot owned by WT and the City of Toronto, [redacted]

- While the governments are not funding any part of Quayside, they are each contributing $416 million to the Port Lands Flood Protection project, which will remediate and flood protect the Port Lands (approximately 880 acres) by about 2024.

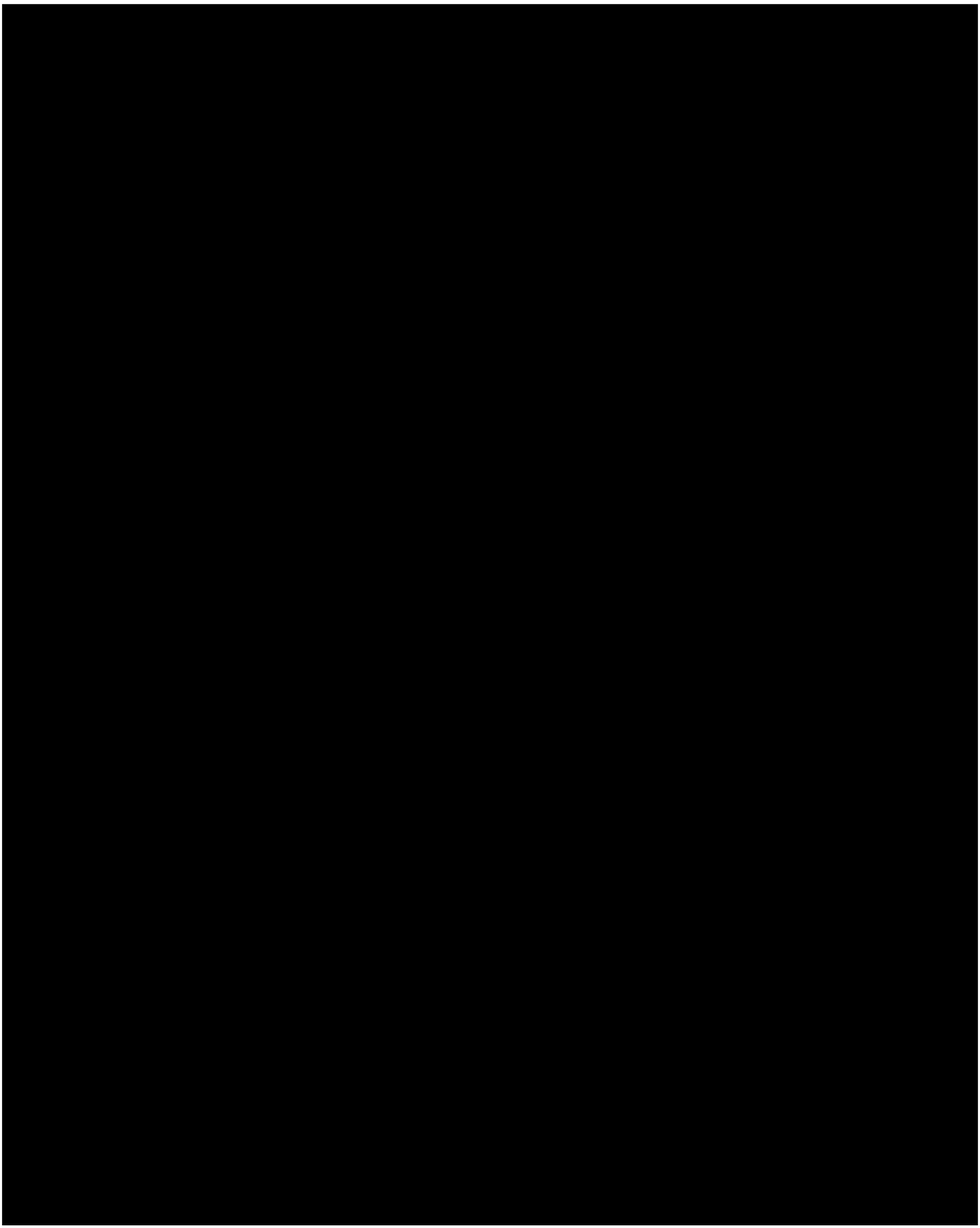
- The funding for the Quayside project is expected to come from SWL, with WT contributing its land as equity. During the coming year, SWL will also be contributing up to $50 million to WT in operational funding during the negotiations phase. The WT Corporate Plan indicates a planned expenditure on Quayside in next year of $3.6M.

[redacted]

- The FA contemplates at 12-month planning exercise to determine what opportunities exist for Quayside. This planning exercise will lead to a Master Innovation Development Plan (MIDP) that will dictate how the parties execute the overall project over the coming years.

[redacted]

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[redacted]

**Annexes**

Annex A: Biographies
Annex B: Waterfront Toronto Presentation
Annex C: Framework Agreement between Waterfront Toronto and Sidewalk Labs
Annex D: Letter from WT management to the Board of Directors responding to questions on Quayside
Annex E: [redacted]

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# William Fleissig, President and Chief Executive Officer



Before joining Waterfront Toronto in January 2016, Will was the President of Communitas Development, a real estate development and advisory company in San Francisco that leads and advises on community-oriented urban developments.

Will has served in the public sector as the Director of Planning and Development for the City of Boulder, Colorado, and as the Director of Downtown Planning and Development in Denver, where he led the city's efforts to revitalize several historical areas of the city. Will is well-known nationally as a development and thought leader, with experience in community engagement, district-scale sustainability, building equitable and inclusive communities, and transit-oriented development.

Will holds a Master in Public Administration with an emphasis on public finance from Harvard's John F. Kennedy School of Government and is also a licensed architect in the State of California.

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# Marisa Piattelli, Chief Administrative Officer

Marisa Piattelli is the Chief Administrative Officer at Waterfront Toronto where she directs key corporate services including human resources management, multi-discipline/multi-stakeholder government and stakeholder relations, reputational and influencer strategies, corporate communications, legal services and business support functions. Previously, a career diplomat, she has over 20 years of international business and finance experience, having partnered closely with business, financial institutions and governments to advance competitiveness agendas and to deliver market share. An easy and experienced public speaker, has developed an extensive network of influencers in business, government and the media.

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# EDWARD CHALUPKA, Director Government Relations



Following his graduation from Dalhousie University with a Master's degree in Public Administration, Ed joined the Ontario Public Service. During his 10 year career with the OPS, Ed held increasingly more responsible positions focusing on fiscal/financial and infrastructure policy in the Ministry of Finance and the Ontario SuperBuild Corporation. Ed also represented the province's interest in the Toronto Waterfront revitalization initiative for three years as part of the Ministry of Public Infrastructure Renewal's Waterfront Secretariat, prior to transitioning to Waterfront Toronto in 2008. As Waterfront Toronto's Director of Government Relations, Ed leads the government relations function of the corporation, building strong and effective working relationships with the three orders of government.

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# Waterfront Toronto

Presentation to Kelly Gillis –
Deputy Minister, Infrastructure Canada

December 19, 2017

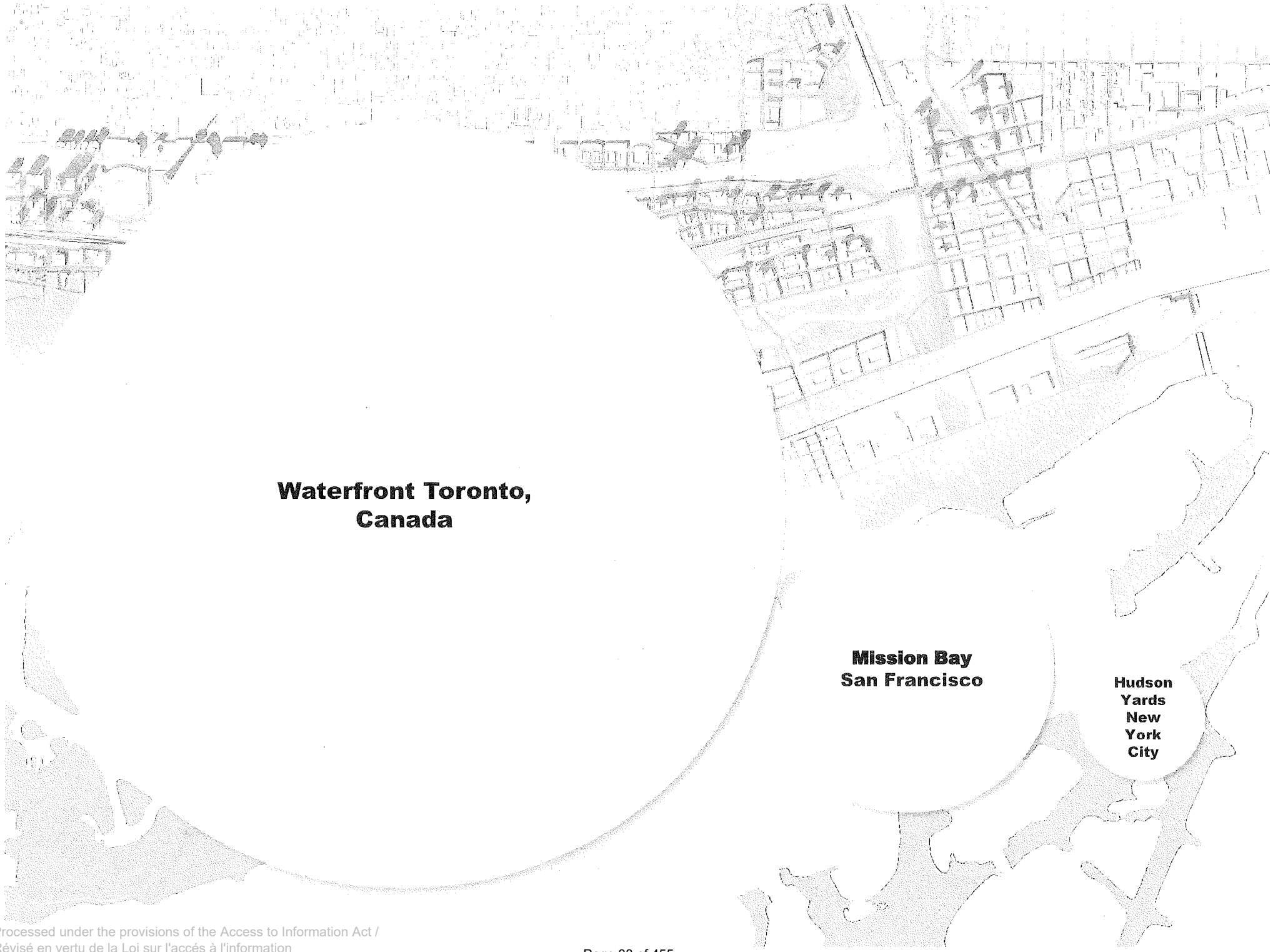
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# Who Are We?

WATERFRONToronto

- Created by the Governments of Canada, Ontario and Toronto in 2001
- Largest urban redevelopment project currently underway in North America - one of the largest waterfront revitalization efforts ever undertaken globally
- Achieve Public Policy Goals
  - Reduce Urban Sprawl
  - Develop Sustainable, Complete Communities
  - Increase the Supply of Affordable Housing
  - Create More Parks & Public Spaces
  - Expand Public Transit
  - Increase Economic Competitiveness, Jobs and Prosperity
- Excellence & Innovation in: urban design, real estate development, technology infrastructure and public engagement
- Transforming the waterfront for the use and enjoyment of the people of Toronto, Ontario and Canada, to foster economic growth and to redefine how the city, province and country are perceived by the world – this is a project of national significance
  - 2013 Federal Audit of the Toronto Waterfront Revitalization Initiative identified lessons learned that could be used as template and inform future large contribution programs across multiple orders of government

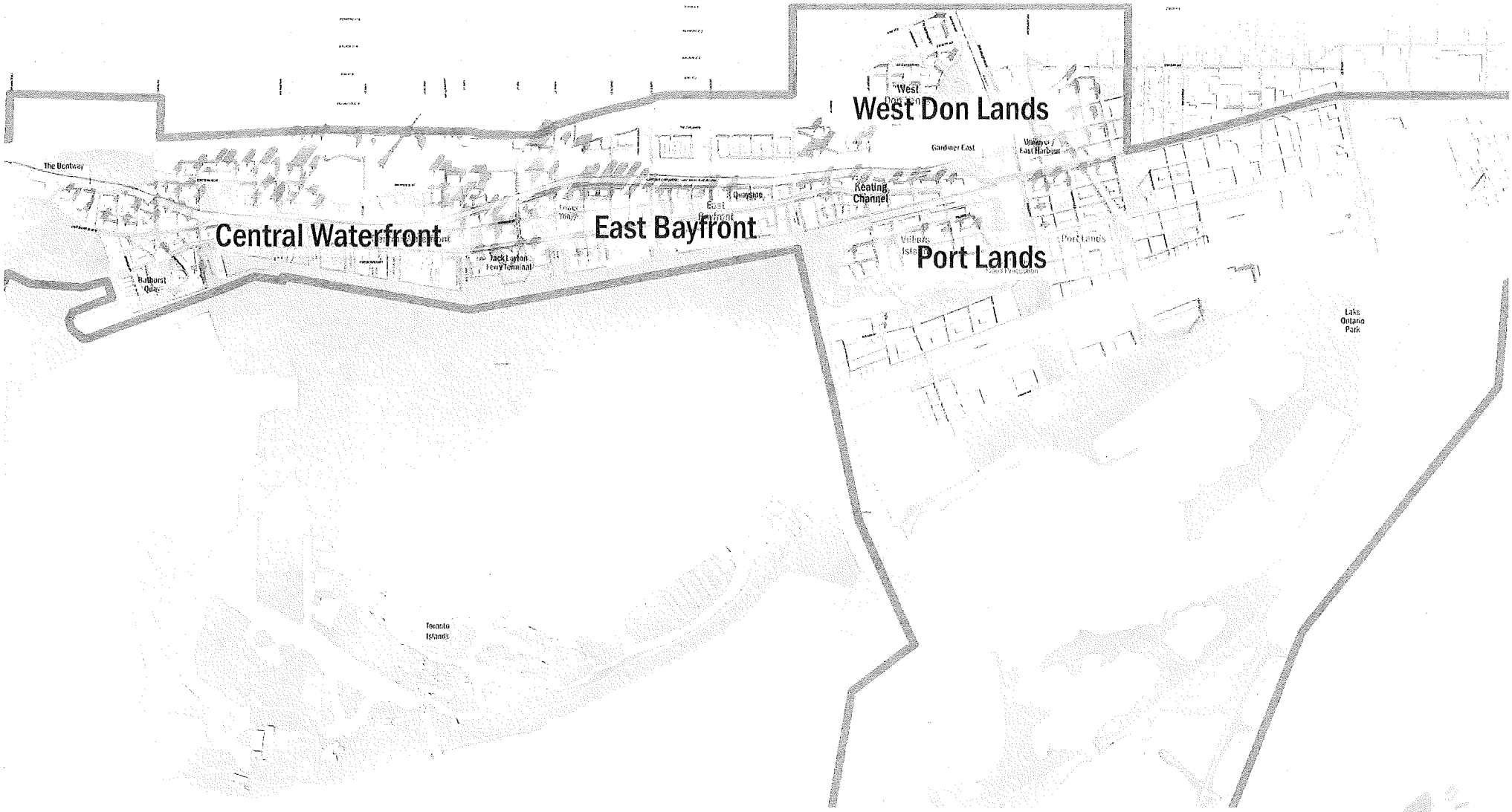
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# Designated Waterfront Area

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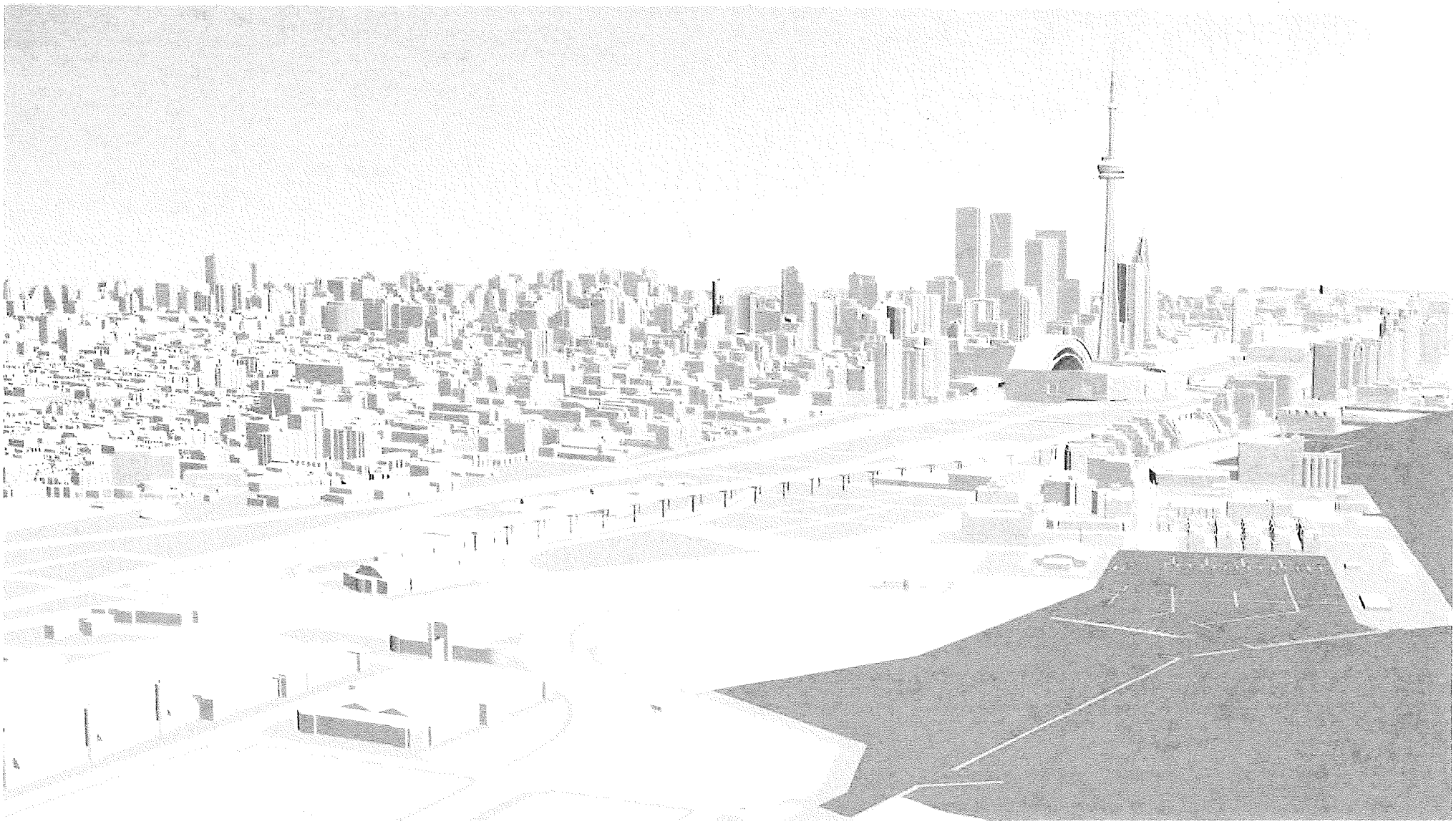



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# 10 Years of Waterfront Growth

## Downtown skyline in 2005

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# 10 Years of Waterfront Growth

## Downtown skyline in 2015

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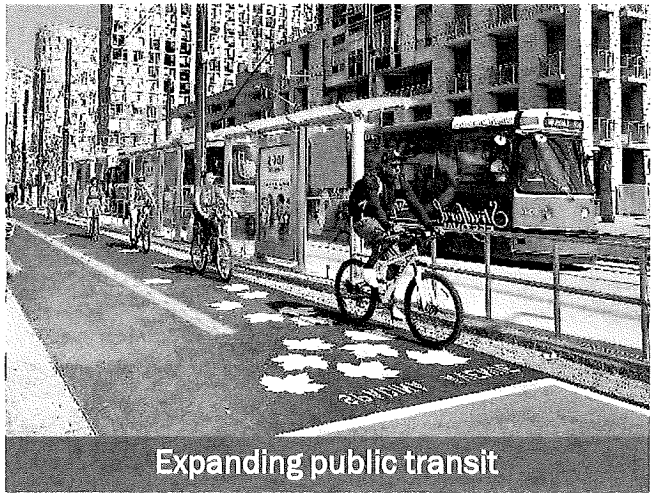
# Our approach


Reducing urban sprawl


Building sustainable communities


Increasing affordable housing


Creating parks & public spaces


Expanding public transit


Driving economic competitiveness

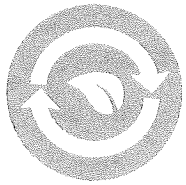
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# Critical Challenges and Opportunities



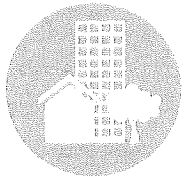
## Prosperity

Leveraging innovation and partnerships to deliver economic growth and jobs



## Sustainability

Cutting-edge solutions to reduce carbon emissions, promote a high quality of life, and nurture healthy people



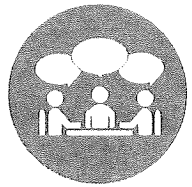
## Neighbourhoods

Advancing Complete Communities that address the need for housing, mobility, accessibility, connectivity and inclusivity



## Destinations

Creating enduring value through well-designed and vibrant cultural, recreational, civic and public spaces



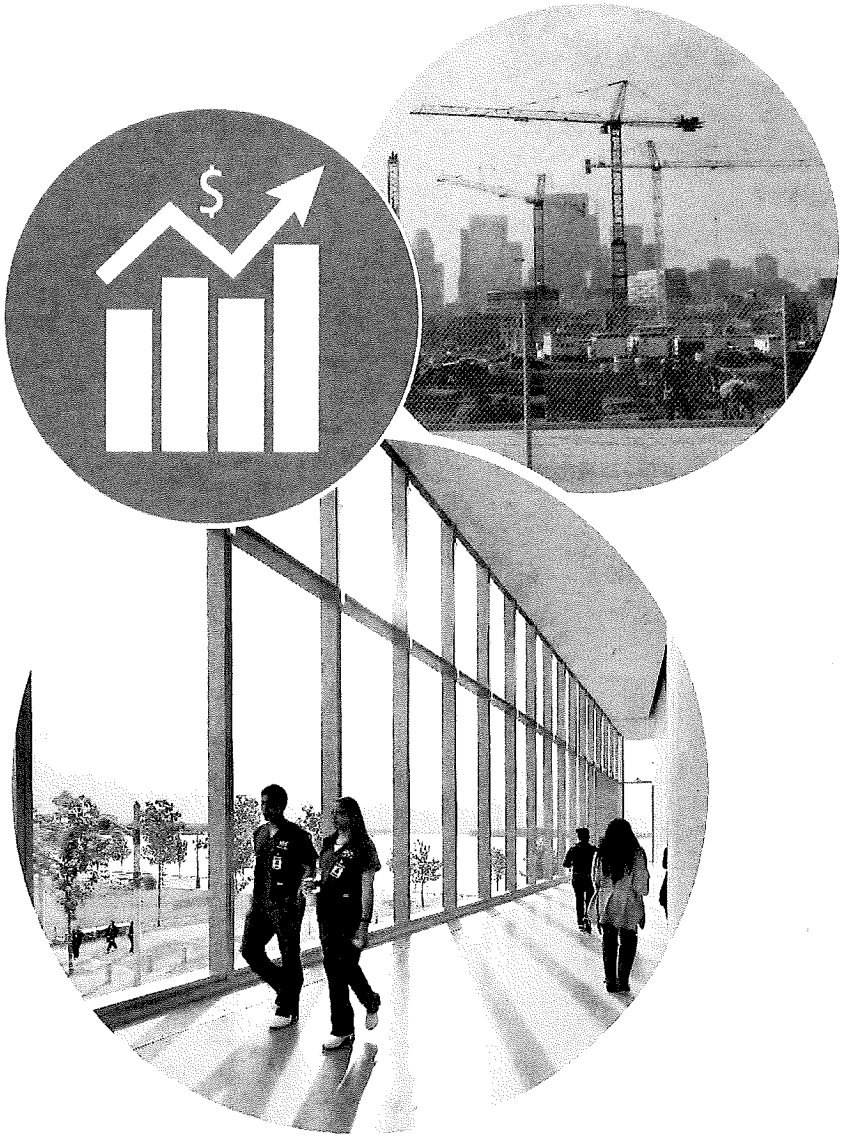
## Engagement

Cultivating a caring organization, promoting broad community outreach and consequential citizen feedback, and using robust data analysis and superior interactive web tools

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# Critical Challenges & Opportunities

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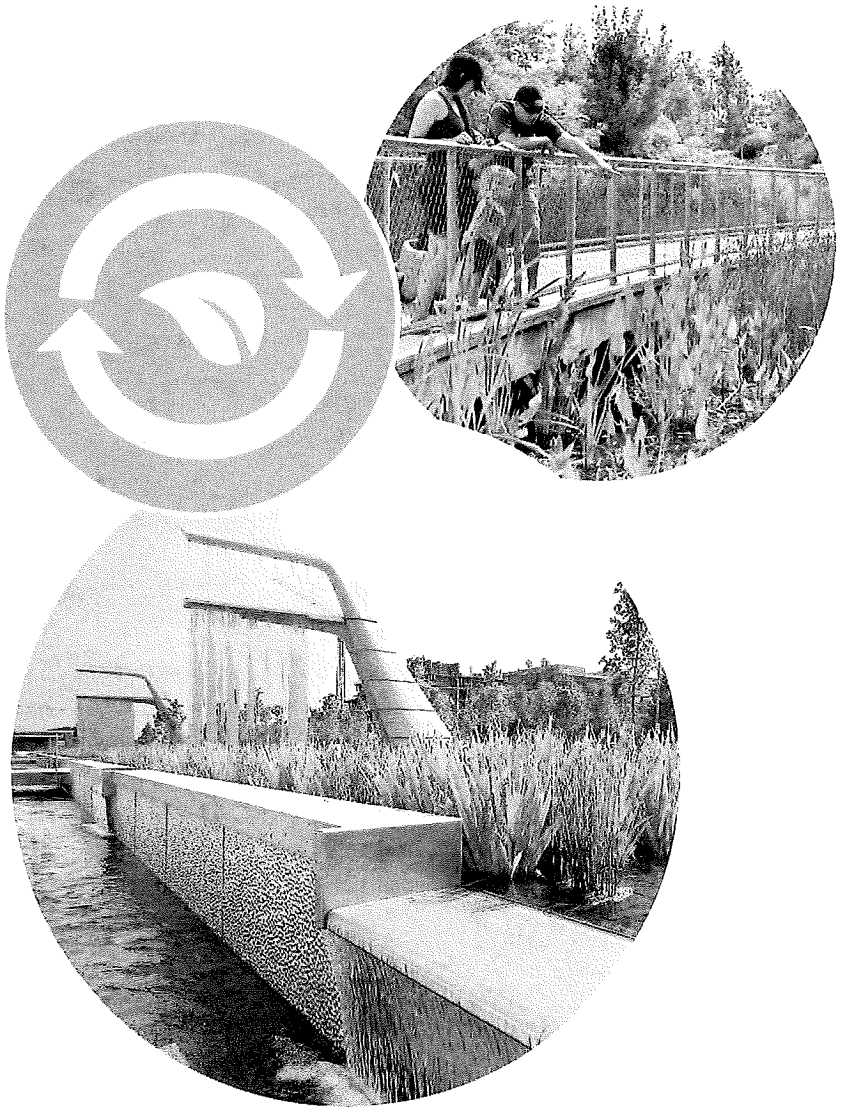


## Prosperity+

Leveraging innovation and partnerships to deliver economic growth and new jobs

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# Critical Challenges & Opportunities



## Sustainability+

Cutting-edge solutions to:

- Reduce carbon emissions
- Promote a high quality of life
- Nurture healthy people

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# Critical Challenges & Opportunities



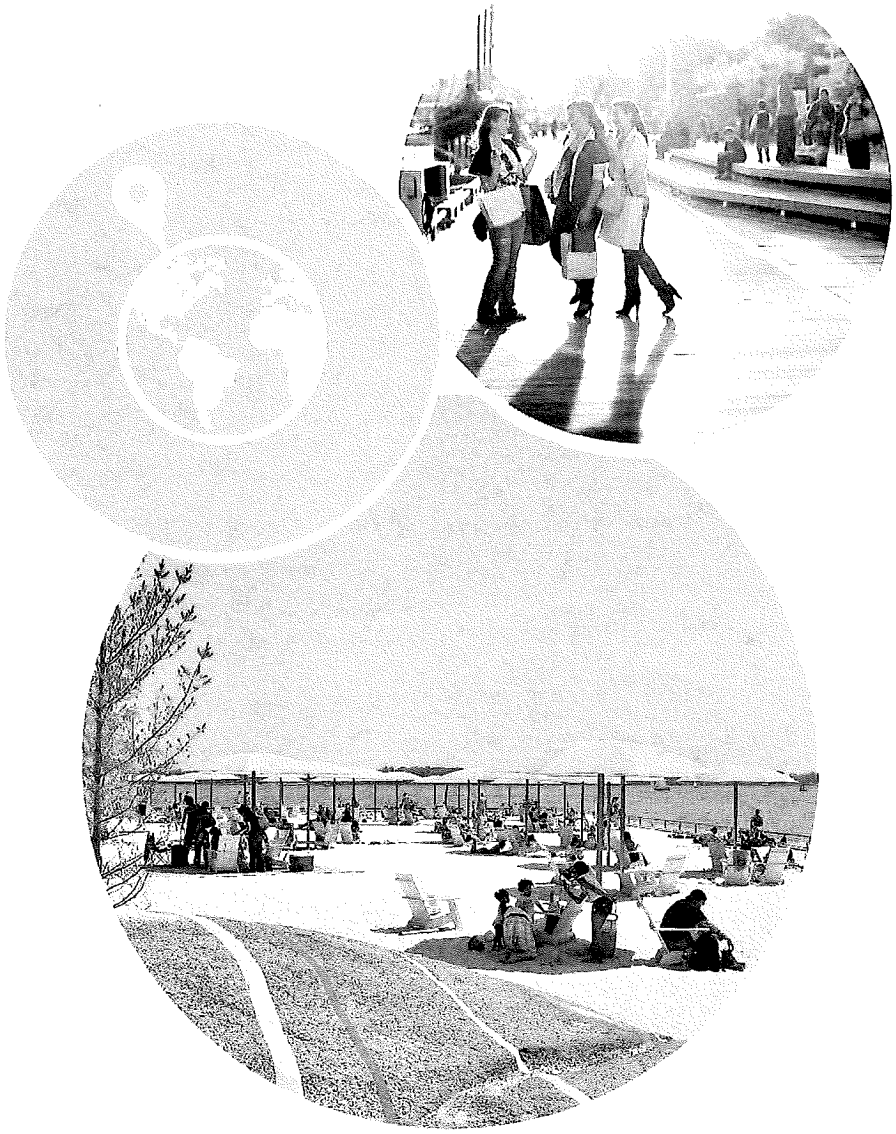
## Neighbourhoods+

Advancing Complete Communities that address the need for:

- Housing
- Mobility
- Accessibility
- Connectivity
- Inclusivity

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# Critical Challenges & Opportunities



## Destinations+

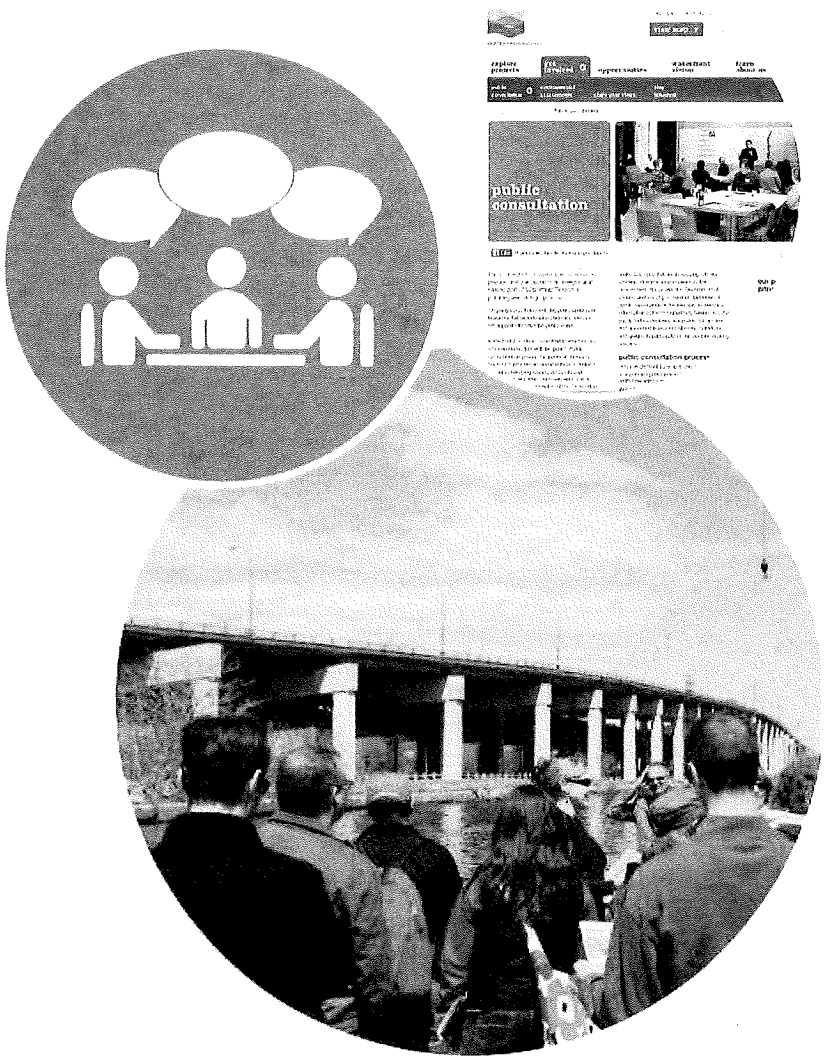
Creating enduring value through well-designed and vibrant:

- Cultural
- Recreational
- Civic
- Public spaces

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# Critical Challenges & Opportunities

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## Engagement+

- Cultivating a caring organization
- Promoting broad community outreach and consequential citizen feedback
- Using robust data analysis and superior interactive web tools

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# A Decade of Results

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# Waterfront Toronto: A Decade of Results

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- *The waterfront now part of Toronto's brand – premier destination attracting visitors, investment and talent*
- 2.5 million square feet of development (completed or planned)
- Over 1,400 built market residential units, additional 1,200 under construction
- 500 affordable housing units, 80 under construction
- First integrated market residential /affordable rental building in Toronto
- 28 km of critical municipal infrastructure
- 36.4 hectares (90 acres) of parks and public spaces
- Privately-funded, fibre optic gigabit network across the waterfront
- First new streetcar line/route in Toronto in 16 years
- Approximately $4.1 billion in economic output to the Canadian economy, over $848 million in revenues to government ($394M to federal gov't)
- $10 billion+ of total market development value on and around the waterfront

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# 25 new or improved parks and public spaces

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# East Bayfront – Before

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# Sugar Beach - Before

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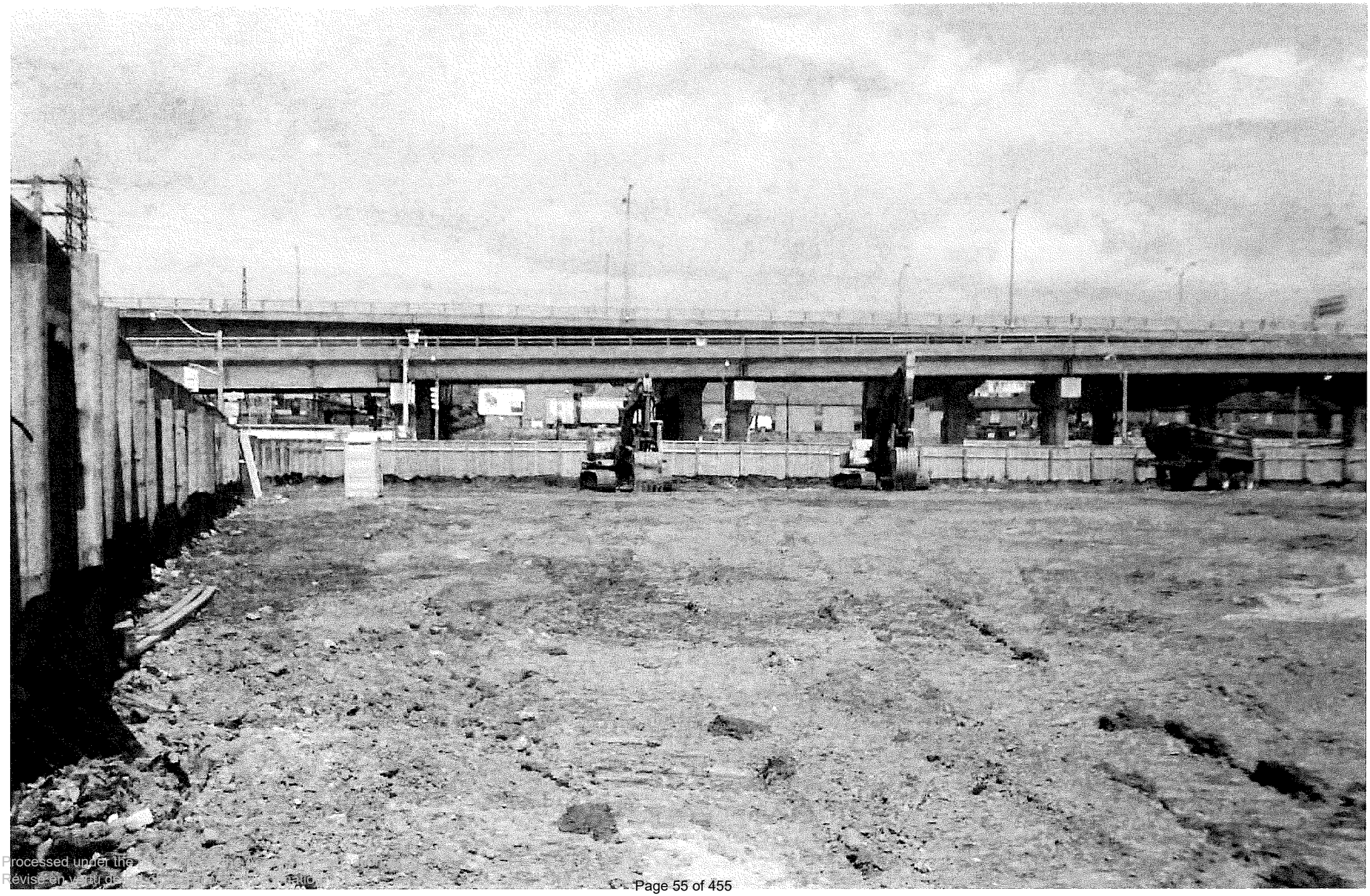
# Sugar Beach - After

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# Sherbourne Common - Before



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# Sherbourne Common- After

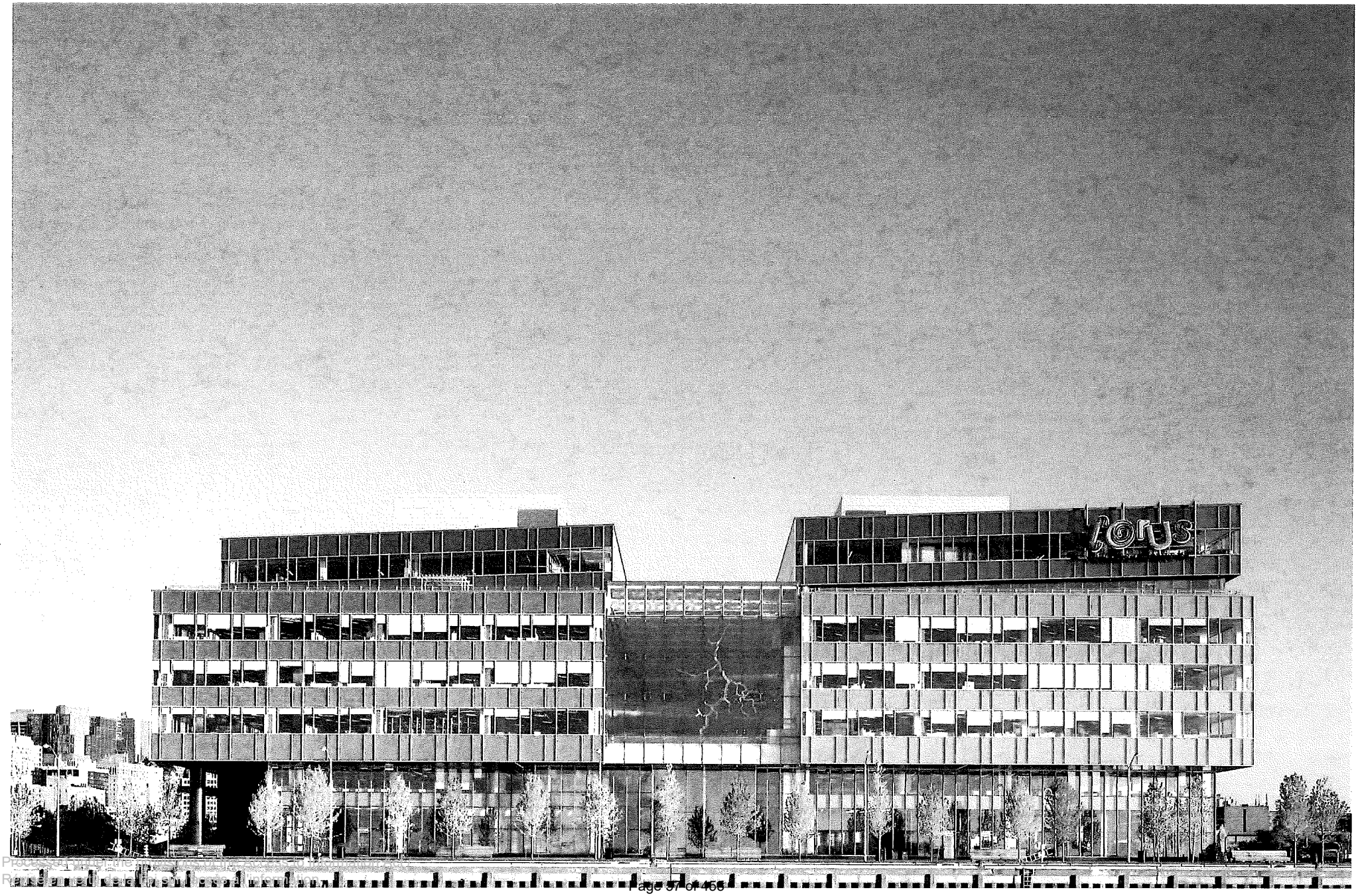
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# Corus Entertainment

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Process is subject to the terms and conditions of the Confidentiality Agreement
Request and Receipt Form

# George Brown College

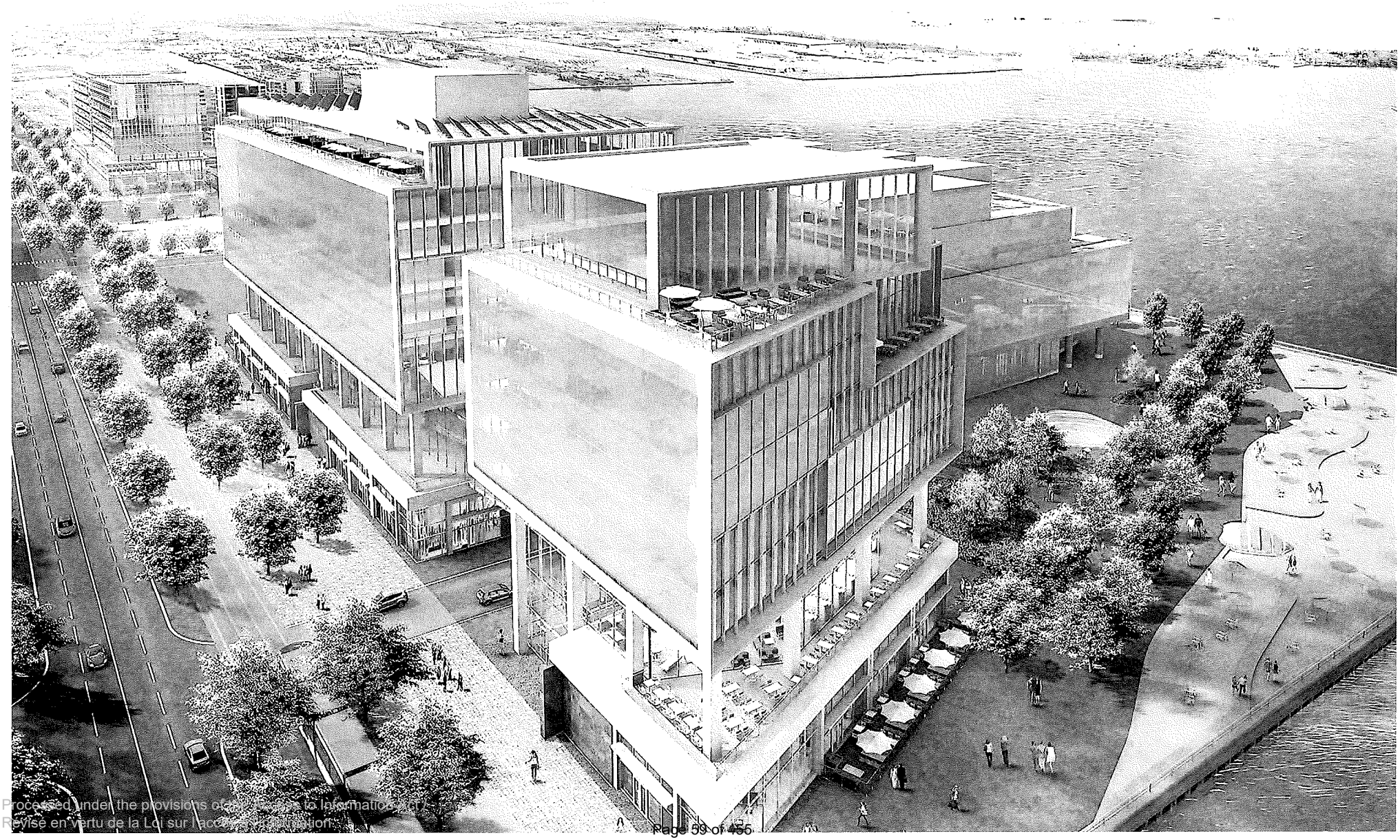
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# Waterfront Innovation Centre

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# Monde Condominiums

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# Bayside Toronto

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# West Don Lands - Before

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# West Don Lands - Today



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# Underpass Park - Before

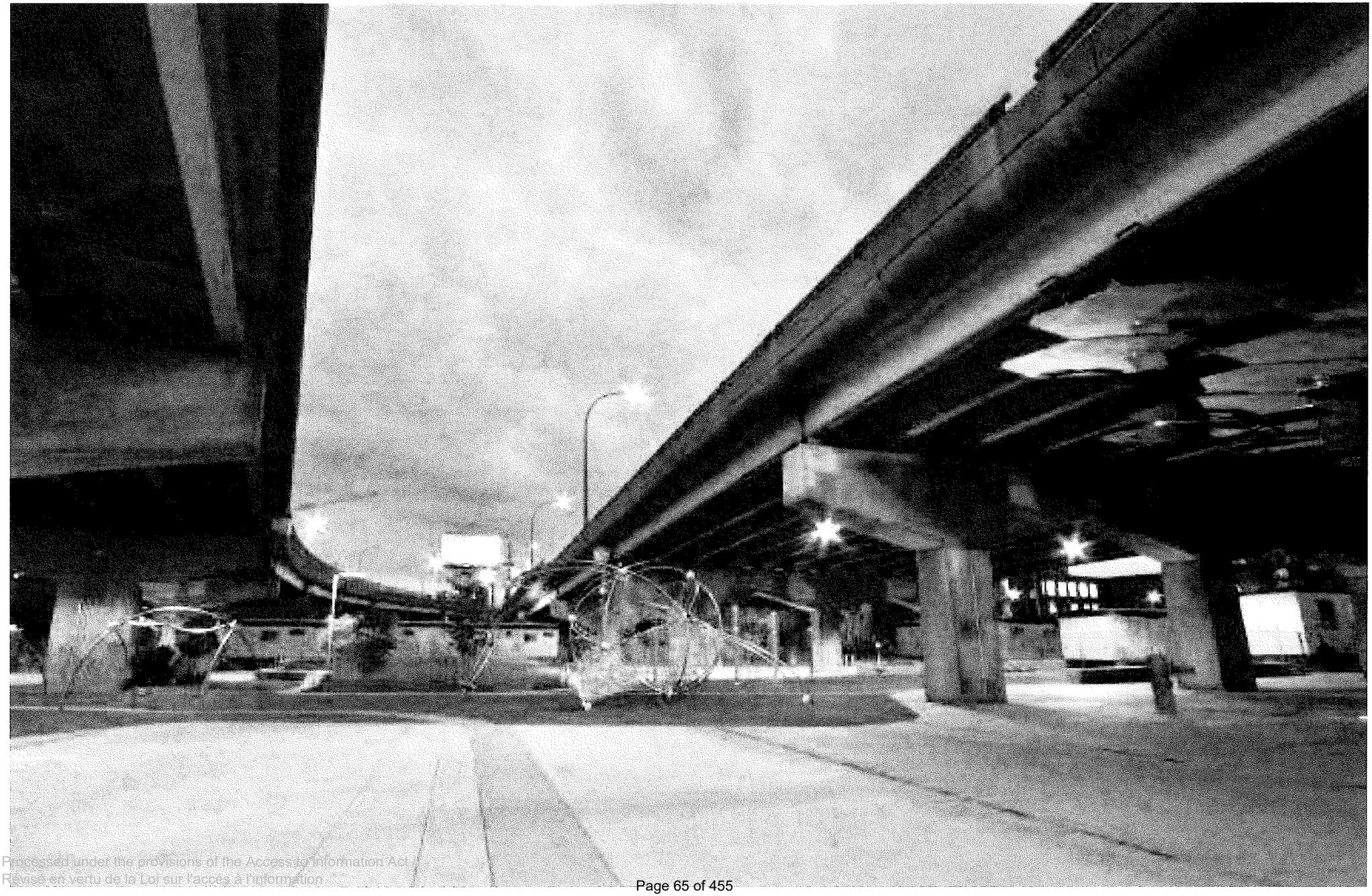
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# Underpass Park - After

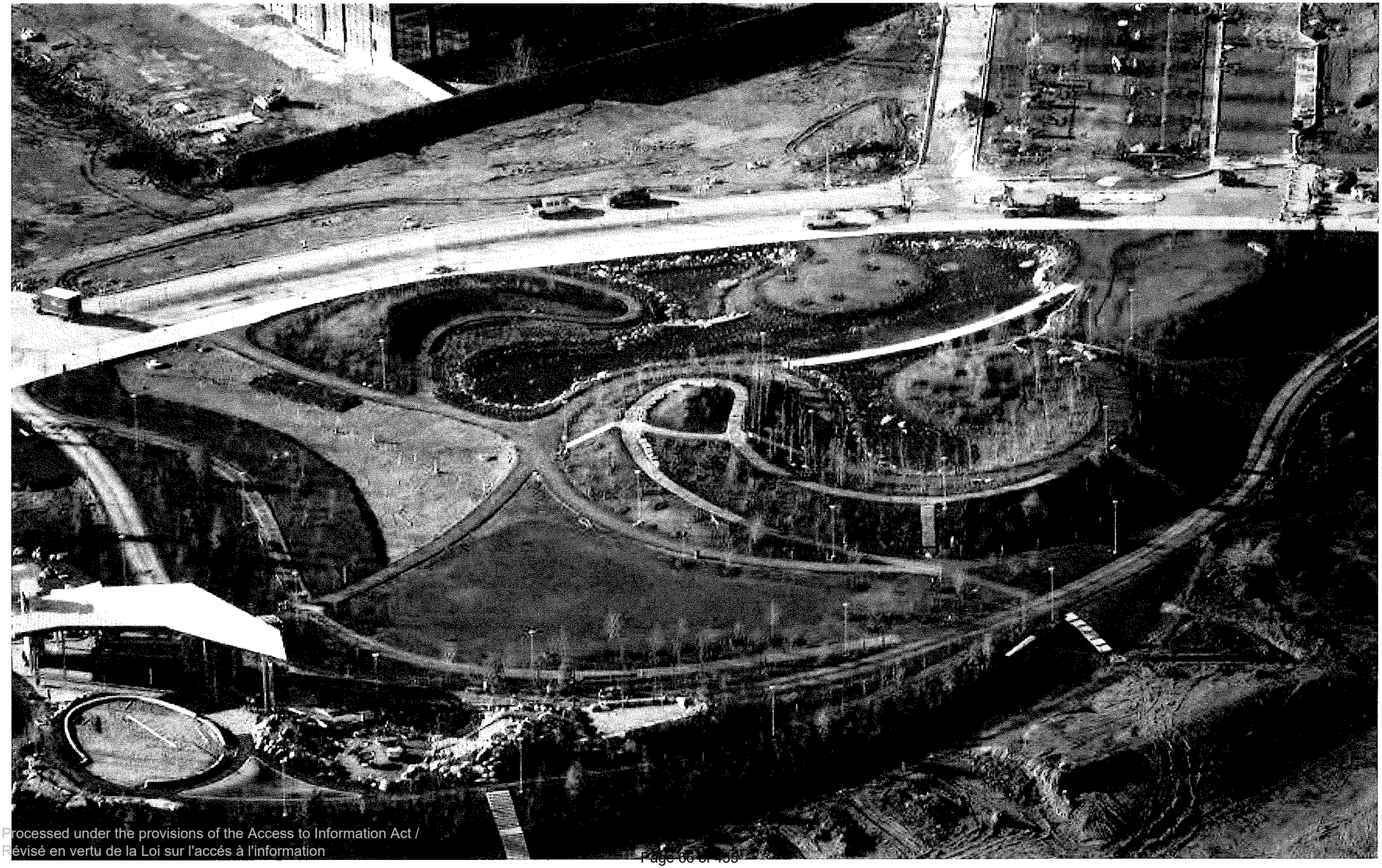
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# Corktown Common Flood Protection Landform

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# Corktown Common

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# River City

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# Toronto Community Housing

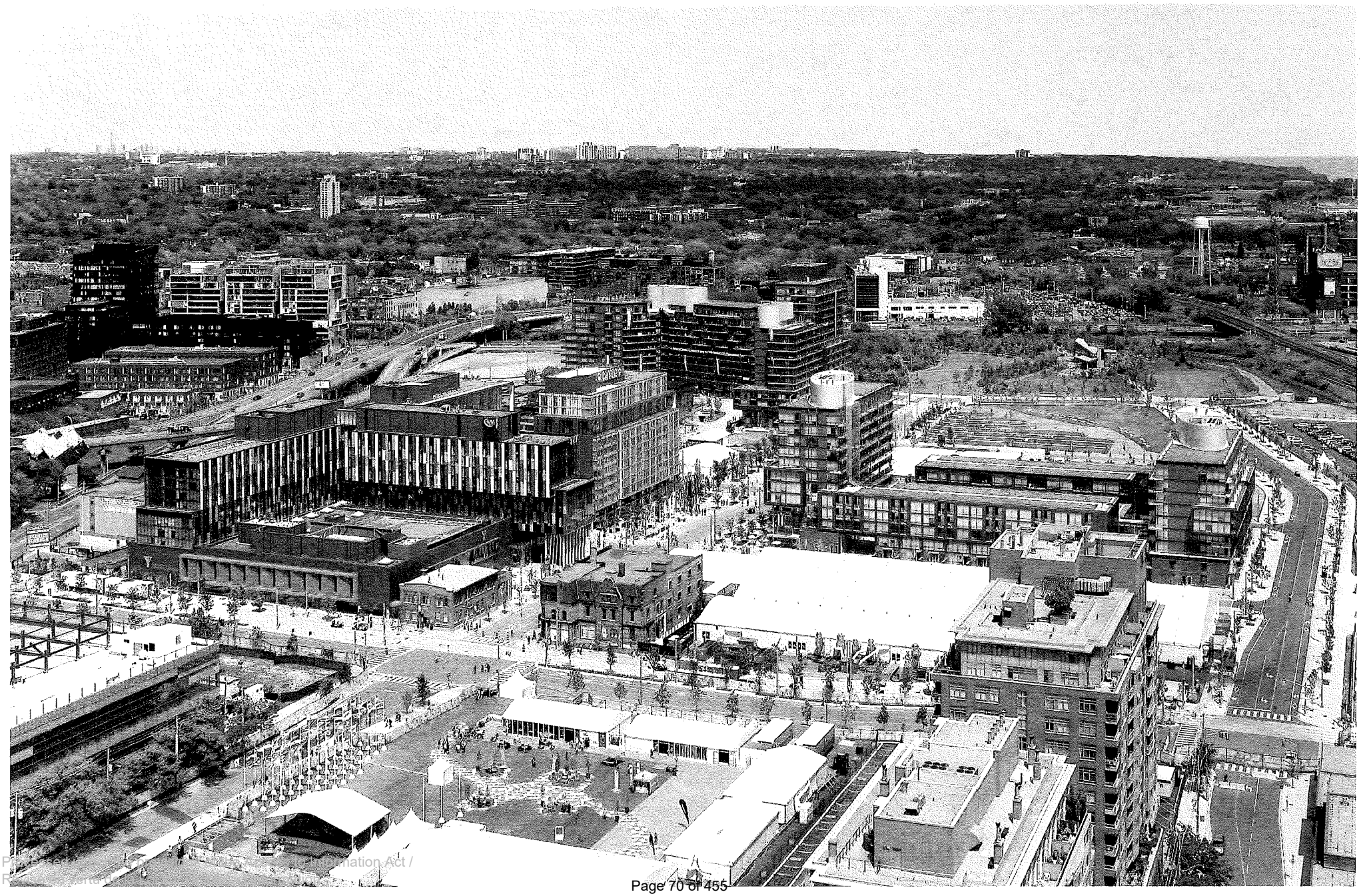
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# 2015 Pan/Parapan Am Athletes Village

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# Queens Quay - Before

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# Queens Quay - After

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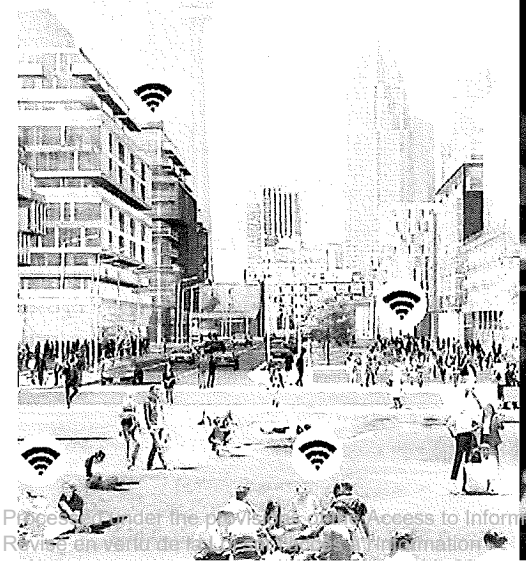


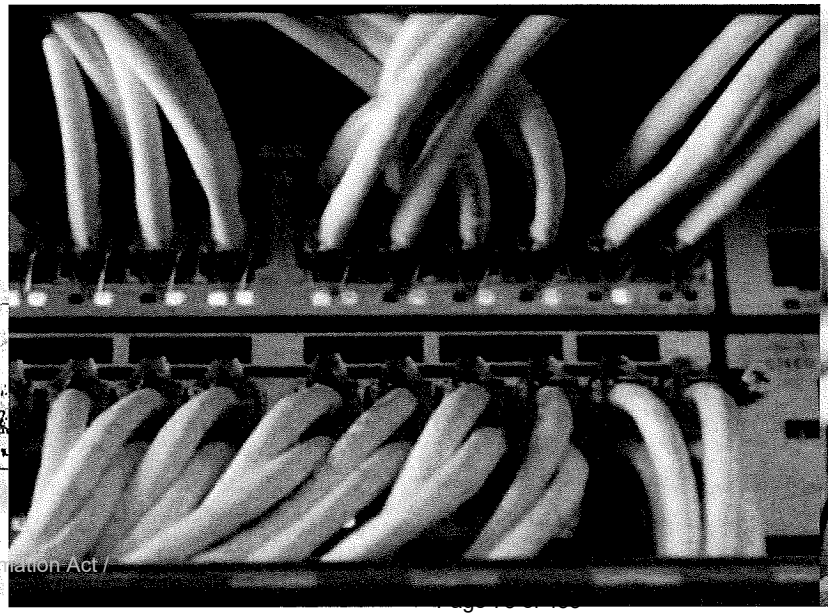
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# Intelligent Communities

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- Privately-funded, fibre-optic gigabit community network
- Guaranteed to be maintained among best in the world for 10 years
- Digital Inclusion strategy
- Toronto Awarded 2014 Intelligent Community of the Year by the Intelligent Community Forum





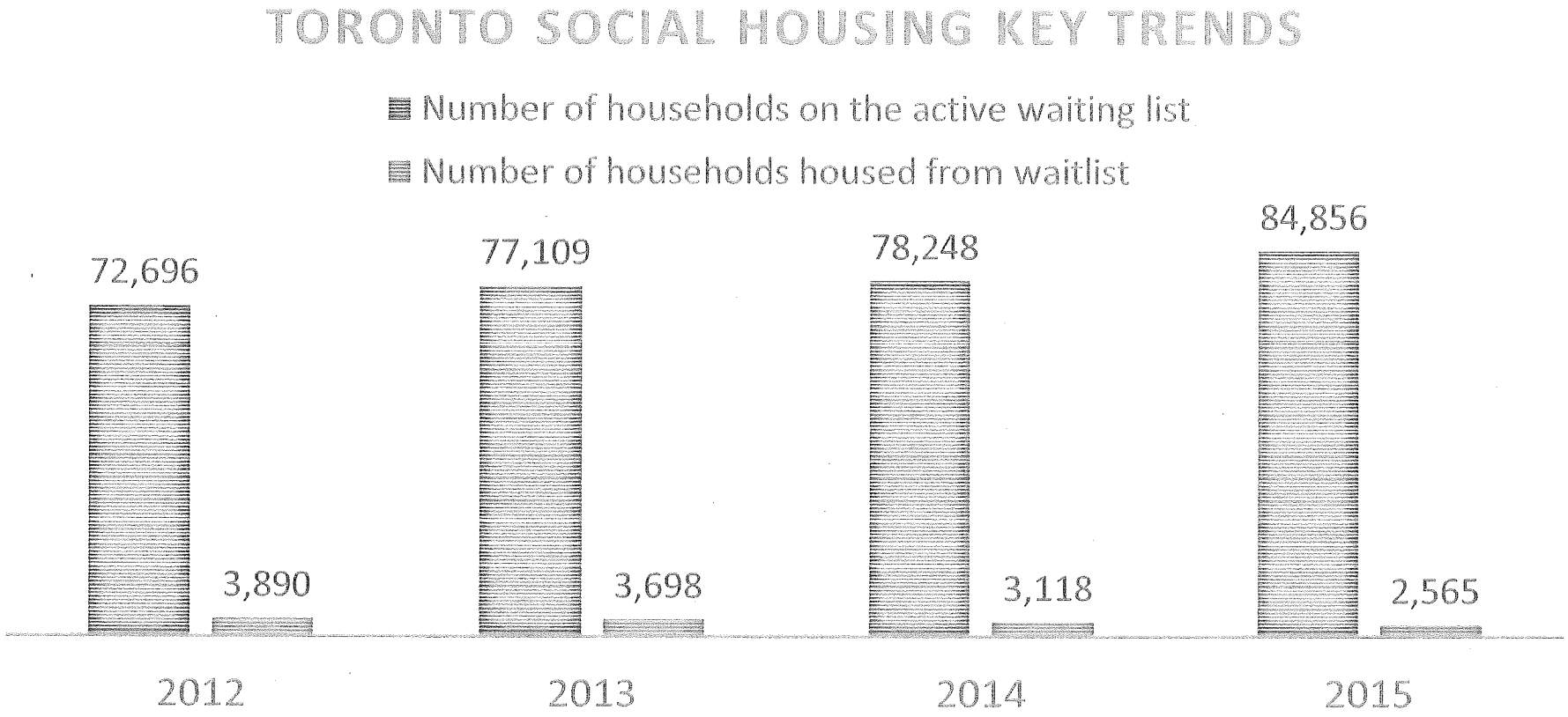



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# Need for Innovation : The Housing Imperative

## A lack of housing affordability has led to a significant housing gap

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**The Gap: 82,000 affordable housing units required**

Source: Housing connections: http://www.housingconnections.ca/information/Reports.asp

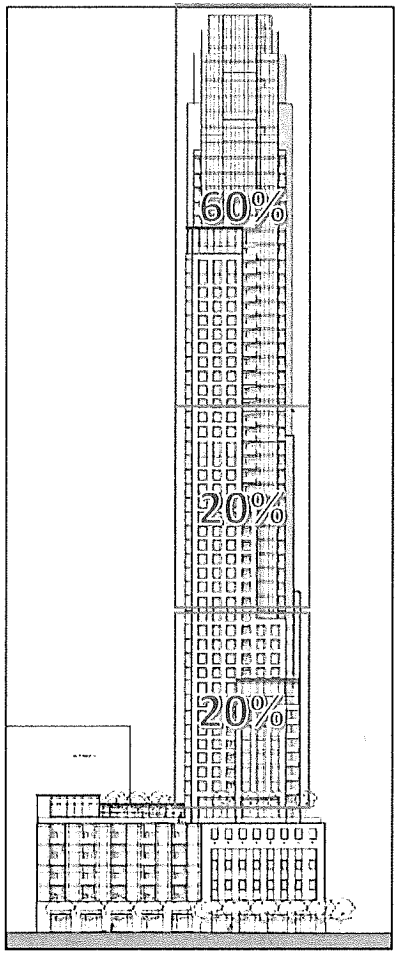
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# Purpose Built Rental: Private Sector Funded

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## With the right incentives, private sector developers can help us meet our affordable housing needs.

- In other jurisdictions (such as NYC) affordable rental housing is being cross subsidized by the private sector market rental units
- The private sector can cross-subsidize the moderate housing through various incentives that the City can provide:
  - Forgiveness of permit fees and development charges
  - Forgiveness of property and land transfer taxes
  - Increased density
  - Focused, expedited planning approvals
  - Lower land values (ground leases)
  - Reduced parking standards

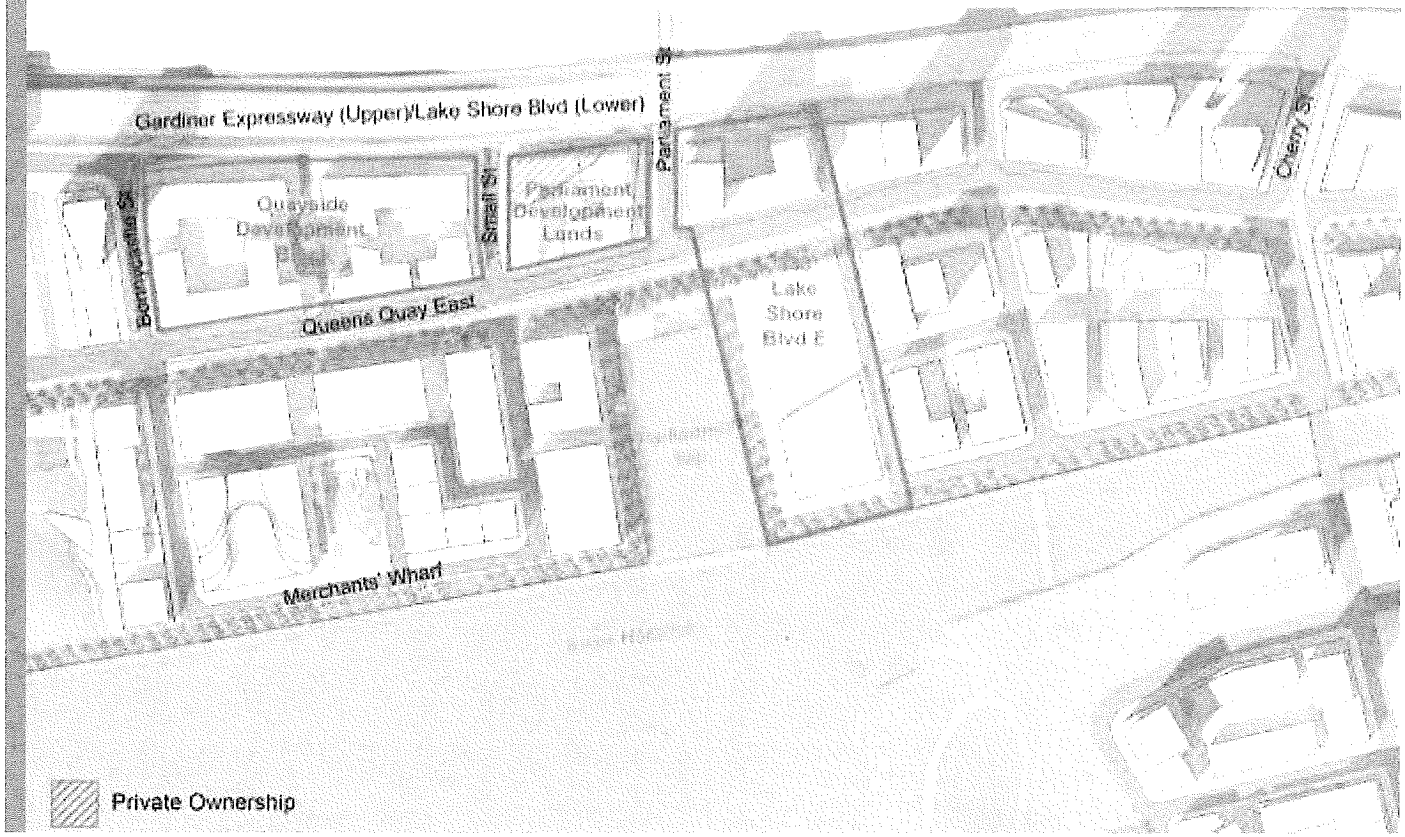



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# The next phase of waterfront revitalization

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# The Subject Lands: Quayside




- Pilot for a vibrant, climate-positive and prosperous community
- Testing ground to establish and transfer best practices to future developments, guiding the vision and desired outcomes for the Eastern Waterfront



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Waterfront Toronto set out to find a unique partner, one with innovation ingrained in its culture, to establish a climate-positive approach to city building

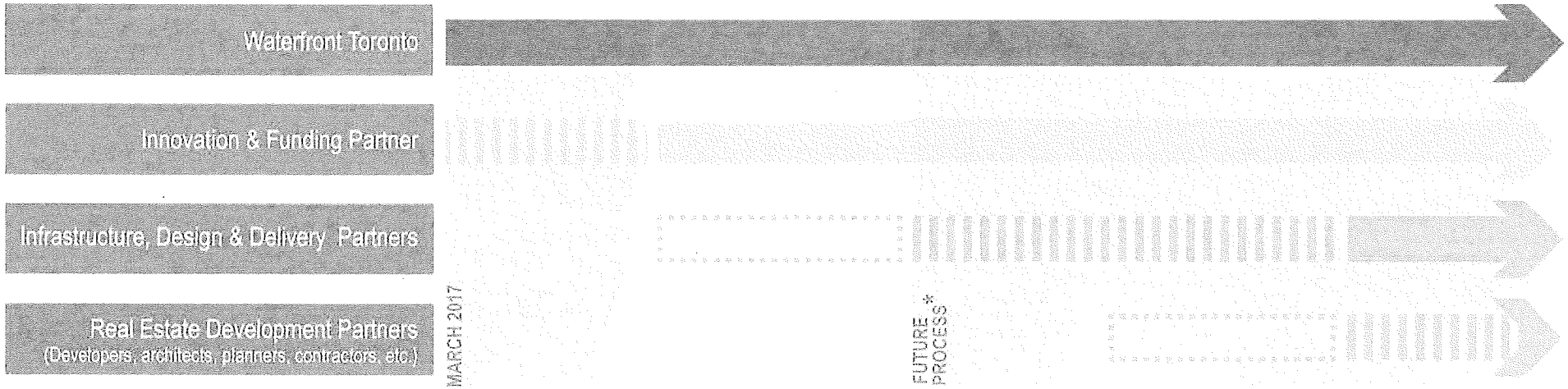





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# Future RFPs

## The Innovation and Funding Partner RFP is the first in a series:




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# A Robust Selection Process

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Stage I – III
Technical + Financial Evaluation

↓

Stage IV
Commercially Confidential Meetings
Best and Final Offer

↓

Stage V
Contract Negotiations

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# Summary Quayside Process Overview

## Market Sounding

**March 2016 – February 2017**

- Process research
- Best practice research
- Market sounding meetings with potential participants and proponents.

## RFP Preparation

**January 2017 – March 2017**

- RFP Drafting
- Legal Review
- Communications and messaging strategy
- Loopback to early market sounding participants to ensure consistency with evolved concepts
- Creation of evaluation framework with KPMG

## Initial Intake and Evaluation

**March 1 – May 20**

- Optional Briefing Session
- Procurement interface for question and answers
- First round submissions due April 27, 2017
- Evaluation Period – April 28 – May 14
- Evaluation Committee Meeting – May 15
- Steering Committee Meeting – May 17
- Shortlisted proponent notification – May 19

## BAFO Submission & Selection

**May 21 – October 17**

- 1st round of CCMs – May 29 – June 2
- 2nd round of CCMs – July 5 - 7
- 3rd round of CCMs (previous project investigation) – July 24 – August 4
- 4th round of CCMs – August 9 - 11
- BAFO Submissions Due – August 22
- Evaluation Period – August 23 – August 29
- Evaluation Meeting – August 30
- Steering Committee Meeting – September 11
- Notification of Preferred Proponent – Sept 11
- Negotiation of initial terms – Sept 13 – Oct 13
- WT Board Approval – October 16
- Announcement – October 17

**Procurement Black Out In Effect**

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Scale Summit

RFP Released

Optional Briefing

Submissions Due

Notification of Shortlisted Proponents

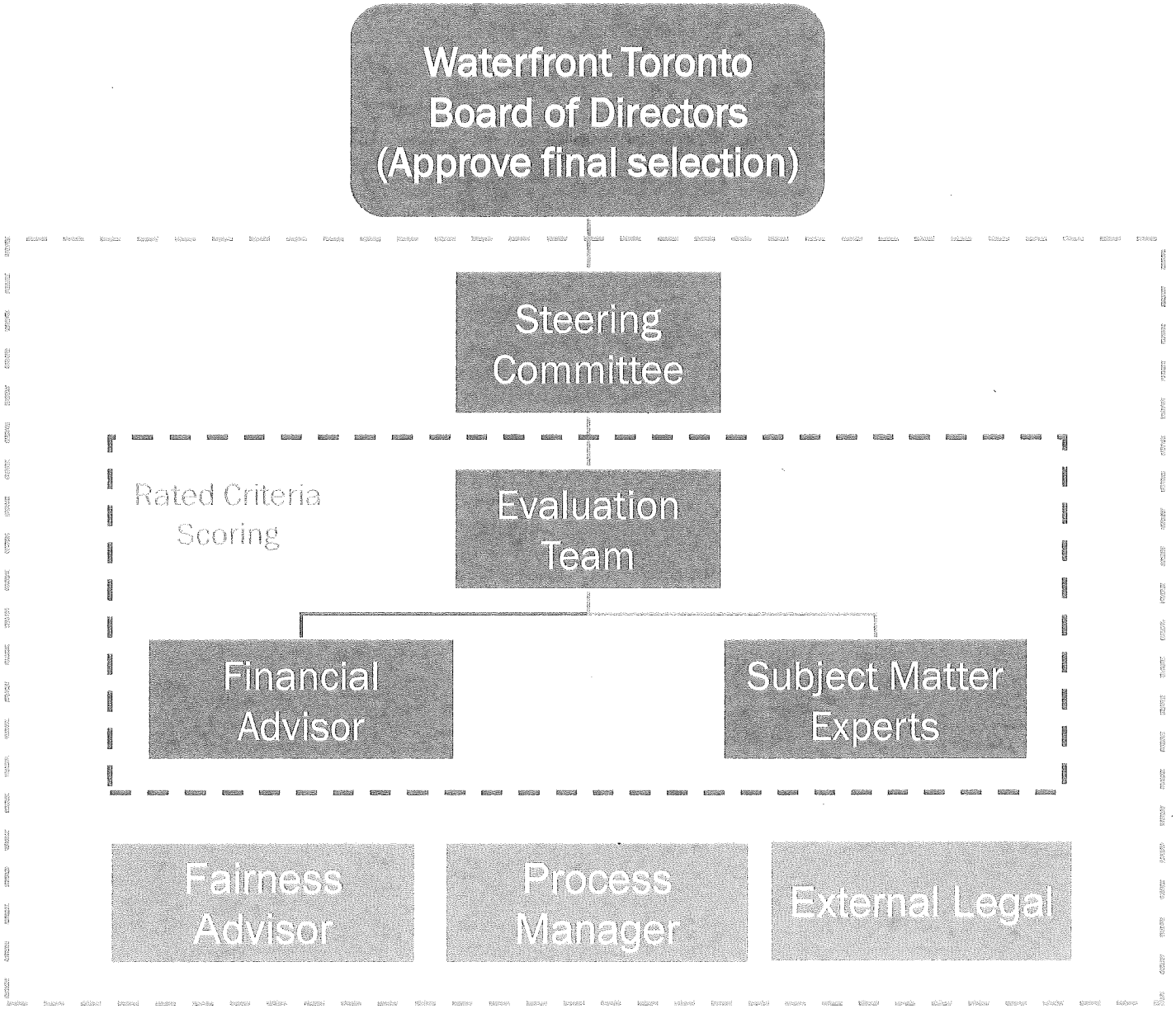
Board Meeting Approval of Proponent

Announcement of Preferred Proponent

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# Extensive Evaluation Process and Oversight

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# Sidewalk's objectives show remarkable similarity to those laid out by Waterfront Toronto

SIDEWALK TORONTO

## *Waterfront Toronto Objectives*

- Create a globally-significant demonstration project that encourages market transformation
- Pilot leading sustainability practices, while providing a test bed for Canada's Cleantech, building materials and technology sectors to support their competitiveness in global markets
- Establish a complete community that provides a range of housing, family sizes and income levels within a mix of uses
- Secure revenue consistent with Waterfront Toronto's Long-Term Financial Plan objectives, using a partnership model that manages financial risk for WT and its partners.
- Quayside as Phase 1 of the Port Lands

## *Sidewalk Labs Objectives*

- Establish the world's most innovative urban district
- Enable a meaningfully superior quality of life including cost of living savings for a diverse population of residents, employers, and employees
- Attract and sustain a diverse twenty-first-century economy, including a cluster focused on urban innovation
- Provide financial viability for long-term investors
- Create a replicable model that could be implemented in multiple locations



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# Timeline Towards a Working Partnership

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**Stage 0**
- Framework Agreement
- Q4 2017

**Stage 1**
- Initial Definitive Documents
- Q1 2018

**Stage 2**
- Initial Plan Milestones
- Q2 2018

**Stage 3**
- Master Innovation & Development Plan
- Subsequent Definitive Documents
- Q4 2018

Waterfront Toronto is at the beginning of an extensive, year-long multi-stage process to develop a business plan for an innovative and sustainable project with Sidewalk Labs.

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## Executive Summary

1. The Framework Agreement is best understood as an *"**agreement to agree**."*

2. It establishes a ***timeline and budget*** for the parties to advance the vision presented in Sidewalk's RFP into an actionable, concrete business plan and proposal, the "Master Innovation and Development Plan."

3. The Framework Agreement does not fully define certain key commercial terms (land valuation, procurement, governance, etc.). Rather it ***provides principles*** that are meant to inform more substantive development agreements. These terms will be defined through the business plan.

4. The Framework Agreement provides ***multiple off ramps*** to both parties and ***Sidewalk bears the financial risk*** if future agreement can not be achieved.

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# Stage 1: Initial Definitive Documents

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## Initial Definitive Documents:

1. Plan Development Agreement
    - Will detail a unified planning approach and establish the roadmap by which Waterfront Toronto and Sidewalk Labs will prepare the Master Innovation and Development Plan

2. Development Plan Budget
    - A budget agreed upon by both Waterfront Toronto and Sidewalk Labs that will provide for anticipated expenses for Stages 1 and 2
    - Sidewalk Labs will cover all of Waterfront Toronto's expenses

## Associated Funding:

Sidewalk Labs, at the beginning of Stage 1, will start to release the Initial Capital Commitment of $10 million, as needed, to facilitate the completion of the above Initial Definitive Documents

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## Initial Plan Milestones

1. Flood Protection Contribution Agreements Executed
2. Reaffirmation of Waterfront Toronto's Mandate
3. Agreement on Scope of Business and Implementation Plan
4. Agreement on Scope of Master Innovation and Development Plan
5. Fair Procurement Standards Established

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# Stage 3: Master Innovation & Development Plan

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1. **Master Innovation and Development Plan (MIDP)**
   - MIDP will be developed collaboratively between Waterfront Toronto and Sidewalk Labs based on the vision and aspirations set out by Sidewalk's RFP submission.
   - The MIDP will detail the plans, pilots and development sequencing for Quayside, while informing future plans for the Eastern Waterfront.
   - Waterfront Toronto's Board will have the opportunity to approve the MIDP.
2. **Implementation Documents**
   - Additional definitive documents and structures will be created during the MIDP phase to allow for implementation upon approval by Waterfront Toronto's Board.

## Associated Funding

Upon completion of the Initial Definitive Documents and the Initial Plan Milestones, Sidewalk Labs will fund the First Contingent Commitment of $40 million to complete the MIDP and the Subsequent Definitive Documents

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# Stage 3: Subsequent Definitive Documents

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1. Implementation Agreement
2. Collaboration Agreement
3. Formation documents for the Infrastructure Vehicle
4. Land acquisition and capital commitment agreements
5. Initial terms for:
    - Development Agreements
    - Project Agreements
    - Service Agreements

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**are exempted**
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**La/les page(s) 91 à 136**
**Font l'objet d'une exception totale**
**conformément aux dispositions de paragraphe**
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**de la *loi sur l'accès à l'information***

ATIA - 21(1)(a)
ATIA-13(1)(e)

Infrastructure Canada

**PROTECTED B**

# SCENARIO NOTE

## Toronto Waterfront Revitalization Initiative – Intergovernmental Steering Committee

## Meeting between Deputy Minister of Infrastructure and Communities, Ontario, Toronto and Waterfront Toronto

| | | |
|---|---|---|
| **Date/Time:** | January 25, 2018, 2:00-3:30 | |
| **Location:** | By Video Conferencing or in-person at the Toronto City Hall 24E | |
| **Subject:** | Intergovernmental Steering Committee (IGSC) between Infrastructure Canada, the Ontario Ministry of Infrastructure, the City of Toronto and Waterfront Toronto to discuss the Port Lands Flood Protection and Enabling Infrastructure Project (PLFP), as well as the Quayside Project. | |
| **Participants:** | **INFC**<br>Kelly Gillis (Deputy Minister)<br>Marc Fortin (Assistant Deputy Minister)<br>Marie-Pier Nassif (Director – Ontario)<br>Kathy Morin (Manager – Ontario)<br><br>**Ontario Ministry of Infrastructure**<br>George Zegarac (Deputy Minister)<br>Luke Hillan (A/Director) | **City of Toronto**<br>Peter Wallace (City Manager)<br>David Stonehouse (Director)<br>Jay Paleja (Manager)<br><br>**Waterfront Toronto**<br>William Fleissig (CEO)<br>Marisa Piatelli (Chief Strategy Officer)<br>Meg Davis (Chief Development Officer)<br>Edward Chalupka (Government Relations)<br>David Kusturin (Chief Project Officer)<br>Julius Gombos (Senior Project Director) |

**Departmental Objectives**

- The IGSC will allow INFC officials to receive updates and discuss the next steps regarding the following agenda items:
  - Port Lands Flood Protection Contribution Agreement (CA);
  - [redacted]
  - Quayside project and its partnership with Sidewalk Labs (SWL), particularly as it relates to the status of the deliverables under the Framework Agreement; and
  - [redacted]

**Stakeholder Objectives:**

- The City of Toronto will be updating the IGSC participants on its Staff Report to Council, which will focus on the PLFP Project and discuss the timing of the 2018 reports.
- The Province and the City will discuss Government-Led Audits of WT and related next steps. [redacted]

[redacted]

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- The Quayside project and its partnership with SWL including the status and timelines for the Framework Agreement deliverables; and

[redacted]

**Context**

- A meeting agenda for the quarterly IGSC can be found in **Annex 1**. The last IGSC meeting was chaired by the City of Toronto on November 6, 2017; minutes for which can be found in **Annex 2**.

**Port Lands Flood Protection Contribution Agreement**

- The January 25, 2018 IGSC will provide a forum for the three levels of government to discuss the steps required to finalize the PLFP Contribution Agreement. To date, the three levels of government have formulated a draft quadripartite CA which has undergone a first round of legal review. A meeting is planned in early February between the three levels of government for final comments with the intention to provide a copy to WT shortly thereafter. The expectation is to have a final CA by March 31, 2018.

- Details of the CA are being negotiated between the three levels of government. No major issues have been raised to date

[redacted]

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What WT is requesting is that the three levels of government undertake the review in order to prevent the possibility of a wind down in 2023.

- The Province is seeking political direction as to which option they will undertake, between the status quo and a review of the WT Corporation. They will be coordinating a response to the Board's request with the City and INFC.

[redacted]

**Quayside**

- A discussion is expected to take place during the meeting surrounding the Quayside project and WT's partnership with SWL. During the month of December 2017, WT met individually with senior representatives from the three levels of government to provide detailed briefings on the PLFP project and expectations regarding WT entering into a Framework Agreement (**Annex 4**) in partnership with SWL for the Quayside project.

- Ahead of the December 18 INFC meeting with WT, legal counsel reviewed the Framework Agreement [redacted] Given that the Framework Agreement only outlines the basic terms and conditions on which the parties will enter into Definitive Agreements, INFC will need to ensure that it has the opportunity to review the Definitive Agreements and confirm that they are in line with the *TWRC Act*.

- The Framework Agreement was executed on October 16 among TWRC, Sidewalk Labs LLC, and Sidewalk Toronto Limited Partnership. Under the Framework Agreement, Sidewalk Toronto Limited Partnership is to serve as the "Master Developer" or "Innovation and Funding Partner" under which the Master Innovation and Development Plan (MIDP) will be developed and implemented for the Quayside project.

[redacted] The three levels of government will have to review the Definitive Documents as government approvals will likely be required under the Ontario *TWRC Act*.

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- The Quayside team is currently developing a work plan containing information on procedures, timelines, protocols (e.g., Intellectual Property, Data Privacy), as well as public and stakeholder engagement.

**Audit of WT**

[redacted]

- INFC officials will continue to receive updates on this topic through the Tri-Government Working Group and will provide input as required.

[redacted]

**Next Steps**

- The next IGSC is scheduled for May 10, 2018 (2:00 to 3:30 pm).
- INFC will be asked to chair the IGSC meetings for 2018/19.

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**Points to Register**

*Project Contribution Agreement*

- INFC, in partnership with the Province and the City through the Tri-Governmental Working Group, is committed to continuing work to develop the quadripartite Contribution Agreement.

[redacted]

*Quayside*

- As non-funding partner on Quayside, we have no comments at this point. However, we would like to understand how these talks may implicate governments going forward especially with the finalization of the Definitive Agreements between WT and SWL.

- INFC officials would like to be kept abreast of developments on a regular basis.

*Next Steps*

[redacted]

**Annexes:**

Annex 1: Agenda and Annotated Agenda
Annex 2: Minutes from the November 6th, 2017 IGSC Meeting
Annex 3: [redacted]
Annex 4: Framework Agreement
Annex 5: [redacted]
Annex 6: [redacted]

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ATIA - 21(1)(a)
ATIA - 21(1)(b)
ATIA - 21(1)(c)
ATIA - 23

# IGSC Agenda
# January 25, 2018

City Hall 24E and by Video Conference
2:00 – 3:30 PM

1. Welcoming Remarks and Introductions – City (5 Min)

2. Approval of November 6, 2017 IGSC Minutes – ALL (5 Min) – Decision Item
   - Point 5 - Tri-Government Implementation Accord: Minutes mentioned that the upcoming January IGSC meeting may be the time to review and approve the roles and responsibilities for the MOU prepared by the Tri-Governmental Working Group (TWG). TWG did not advance on this subject, all resources have been directed towards the March 31 deadline for an executed CA.

3. Port Lands Flood Protection – ALL (20 Min) – Information Item
   (i) Project Update (WT)
   (ii) Contribution Agreements Update (City)
   (iii) City Staff Report (City)
   - Meetings have been set up among the three levels of government in the next couple of weeks to go over the latest draft of the quadripartite Contribution Agreement with the intention to provide a draft to WT by early February.

[redacted]

5. Quayside – ALL (20 Min) – Information Item
   (i) Project Update (WT)
   (ii) City Staff Report (City)
   - The Quayside Committee informed the Board of Directors on December 7, 2017, that the 60-day timeframe to have Stage 1 completed as per the terms of the Framework Agreement has been extended. The Committee will take the time necessary to negotiate with Sidewalk Labs. An updated timeline is still pending.

[redacted]

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# IGSC Agenda
# January 25, 2018

City Hall 24E and by Video Conference
2:00 – 3:30 PM

- The Quayside team is currently developing a work plan containing information on procedures, timelines, protocols (e.g., Intellectual Property, Data Privacy) and public and stakeholder engagement.

6. Government-Led Audits of WT – ALL (10 Min) – Decision Item
   (i) City Staff Report (City)
   (ii) Audit Plan and 2018 Audit (City)
   - Ernst and Young (EY) Audit is completed
   - EY has been awarded the ERP Audit and will begin work shortly

[redacted]

8. WT Financial Update – WT (5 Min) – Information Item
   (i) Quarterly Financial Report
   (ii) Borrowing
   (iii) Annual Plan

9. Other Business (5 Min)
   (i) WT
   (ii) Federal Government
   (iii) Provincial Government
   (iv) City

10. In Camera (If necessary) – (10 Min)

**Key Dates:**

Deadline for Flood Protection Contribution Agreement – March 31, 2018
Handover of IGSC Chair to Federal Government – April 1, 2018
IGSC Meeting – May 10, 2018

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Draft for TWG + WT Review

**Toronto Waterfront Revitalization Initiative**
**Intergovernmental Steering Committee**
**Meeting Minutes**

Monday November 6, 2017
2:30 to 4:00 PM

| | |
|---|---|
| Federal Representatives: | Kelly Gillis, Marc Fortin, Roger Soler, Krishen Matharu |
| Provincial Representatives: | George Zegarac, Bruce Singbush, Trevor Bingler, Lynn Kekanovich, Maryam Moadel |
| City of Toronto Representatives: | John Livey (chair), Peter Wallace, David Stonehouse, Jay Paleja, Brett Howell |
| Waterfront Toronto Representatives: | William Fleissig, David Kusturin, Lisa Taylor, Marisa Piattelli, Ed Chalupka, Meg Davis |

| | ITEMS DISCUSSED | |
|---|---|---|
| 1. | Welcome and Introductions | John Livey welcomed all IGSC members to the meeting and highlighted the appointment of Kelly Gillis as the new Deputy Minister, Infrastructure and Communities. |
| 2. | Approval of September 25, 2017 IGSC Meeting Minutes | IGSC minutes were approved with no amendments. |
| 3. | Update on City of Toronto Staff Report | The upcoming staff report that was intended to address the next phase of waterfront revitalization (Waterfront 2.0) has been scaled back to a revised cash flow for Flood Protection and a request to delegate the execution of a Contribution Agreement. The broader Waterfront 2.0 report will likely go to City Council in early 2018, after the budget.<br>The City will circulate the draft report this Friday. The details of the report have already been communicated to the government partners and the report will be written in a "transactional" manner. |
| 4. | Contribution Agreement(s) for Port Lands Flood Protection | Last week the TWG and Waterfront Toronto discussed the major terms for the Contribution Agreement. There is agreement on the major Terms between all levels of government.<br>Legal teams from the respective governments will need to review the details but in general:<br>1. 1 CA with annexes to address the particulars for each government |



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| | | |
|---|---|---|
| | | 2. The CA that could include broad general principles that would be agreed to by all three levels of government with individualized government requirements set out in Annexes to the CA. . Amendments to Annexes can be made by each respective level of government. Feds to add language to make it 1 CA instead of 3 CAs<br>3. 6-9 months to develop Project Charters by the 21 sub-projects because the current outline is based on Due Diligence schedule and is subject to change<br>4. Adequate legal resources from each government partner would help to expedite CA discussions<br>5. CA to be executed by the end of March 2018 |
| 5. | Tri-Government Implementation Accord | The Toronto Waterfront Revitalization Initiative has been without an overarching government agreement since 2014. The original agreement was signed in 2001 and a series of amendments from 2008 onward extended it to 2014.<br><br>The TWG has been working on an update and it is about 50% complete. The TWG will continue drafting the Accord and the upcoming January IGSC meeting may be the time to review and approve the roles and responsibilities for the MOU. Approval from the Provincial Treasury Board may also be required. |
| 6. | [redacted] | |
| 7. | Update on Quayside | WT is preparing a briefing for the Board. The Board has a number of questions related to the Quayside Framework Agreement.<br><br>WT is preparing government briefing materials of the Framework Agreement and will deliver packages today and on November 15. WT will walk each government partner through the Agreement and answer questions.<br><br>WT Board comments have been grouped into key themes. WT will need to work closely with its IGSC partners to ensure the proposed Quayside governance structures are correct. Examples of Board themes include: regulatory and zoning; governance; |



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| | | process and Review (off-ramps); and technology (privacy and technical panels).<br><br>WT staff need to explain the process to Board members. This will include more written packages and sufficient time for reviewing.<br><br>This is a very fluid process. WT needs to identify the risks and address how they are minimizing risk. WT has already had 50-60 partnership requests.<br><br>WT also needs to identify milestones. What is the date that WT and the government partners need to make a decision? Work back from that date and consider elections and community involvement as well.<br><br>Deliverables:<br><br>Stage 1 – Planned Development Agreement (60 days)<br><br>- Work plan for the year<br>- Budget for 3rd party review<br>- Consultants<br>- Land to be transacted and methodology<br><br>Stage 2 (6 months)<br><br>[redacted]<br><br>- Business Implementation Plan<br>- Contribution Agreement<br><br>Stage 3 – Master Development Innovations Plan<br><br>- If agreement, additional dialogue with governments<br><br>5 Exit Ramps from the Agreement<br><br>- Planned Development Agreement (WT but not Sidewalk)<br>- 6 Months if no CA or BIP<br>- Master Development Innovation Plan<br>- Dispute Resolution<br>- WT – Can you please confirm and add 5th off ramp?<br><br>All dates are extendable.<br><br>WT might seek to follow the Heinz contract model or may partner as a developer.<br><br>$50M is completely Sidewalk's risk. Used for initiatives like planning studies.<br><br>WT has to prove what can be delivered on Quayside.<br><br>Government partners need additional information to determine if there are short-term and long-term areas of concern. For instance, have the interests of other parties been impacted by the Sidewalk agreement?<br><br>What does the agreement mean for Quayside, the Port Lands, and the rest of the City? The scoping question needs to be clarified. Currently things seem very speculative and additional |



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| | | details are required. The government partners need more communication with WT not less because the Quayside model appears to be very different than what has been applied over the last 15 years. This raises multiple governance questions that will also need to be addressed.<br>WT indicated the questions being raised from the Board and governments are similar. WT indicated the information sharing sessions with governments will help provide clarity and reduce concerns. |
| 8. | [redacted] | |
| 9. | WT Update<br>(i) Quarterly Financial Report<br>(ii) Borrowing<br>(iii) Annual Plan | (i) Provided at the last IGSC meeting. Details of the next quarterly report will be at FARM committee on November 30th and then shared with the IGSC at the next meeting.<br>(ii) 17M forecasted for Q4 is now lower due to the deferral of the Royal Canadian Yacht Club expense and other changes.<br>(iii) Annual Plan needs to be approved by the end of December. The Plan anticipates $325M of investments, with three-quarters attributed to Flood Protection and Cherry Street Lakefilling. A draft copy will be circulated for review. |
| 10 | Other Business<br>(i) Waterfront Toronto<br>(ii) Federal Government<br>(iii) Provincial Government<br>(iv) City of Toronto | (i) Project Management Office is being set up for the beginning of Q1: 2018. There is a new corporate IT system. Capital risk and project risk will be examined independently.<br>WT will be looking at risk from both corporate and project risk perspectives. WT is also considering the timing of how and when they should staff up Quayside. |
| 11 | In-Camera Session | The government partners requested an in-camera session. |



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[redacted]

ATIA - 20(1)(b) ATIA - 20(1)(d)

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[redacted]

ATIA - 20(1)(b)

ATIA - 20(1)(d)

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ATIA - 21(1)(b)
ATIA - 19(1)

## Caron3, Nathalie (INFC)

**From:** Sohi, Honourable/Honorable Amarjeet (INFC)
**Sent:** December 19, 2017 10:23 AM
**To:** Executive Correspondence / Correspondance exécutive (INFC)
**Subject:** FW: [redacted]
**Attachments:** [redacted]

**Importance:** High

(3)

**From:** [redacted]
**Sent:** December-15-17 3:27 PM
**To:** [redacted]
**Cc:** Board of Directors <BoardofDirectors@waterfrontoronto.ca>; Sohi, Honourable/Honorable Amarjeet (INFC) <amarjeet.sohi@canada.ca>; [redacted] Gillis, Kelly (INFC) <kelly.gillis@canada.ca>; [redacted]
**Subject:** [redacted]
**Importance:** High

Dear [redacted]

Please find attached a formal request for the [redacted]

Thank you,
Mary

(Sent on behalf of [redacted]

[redacted]

WATERFRONTtoronto

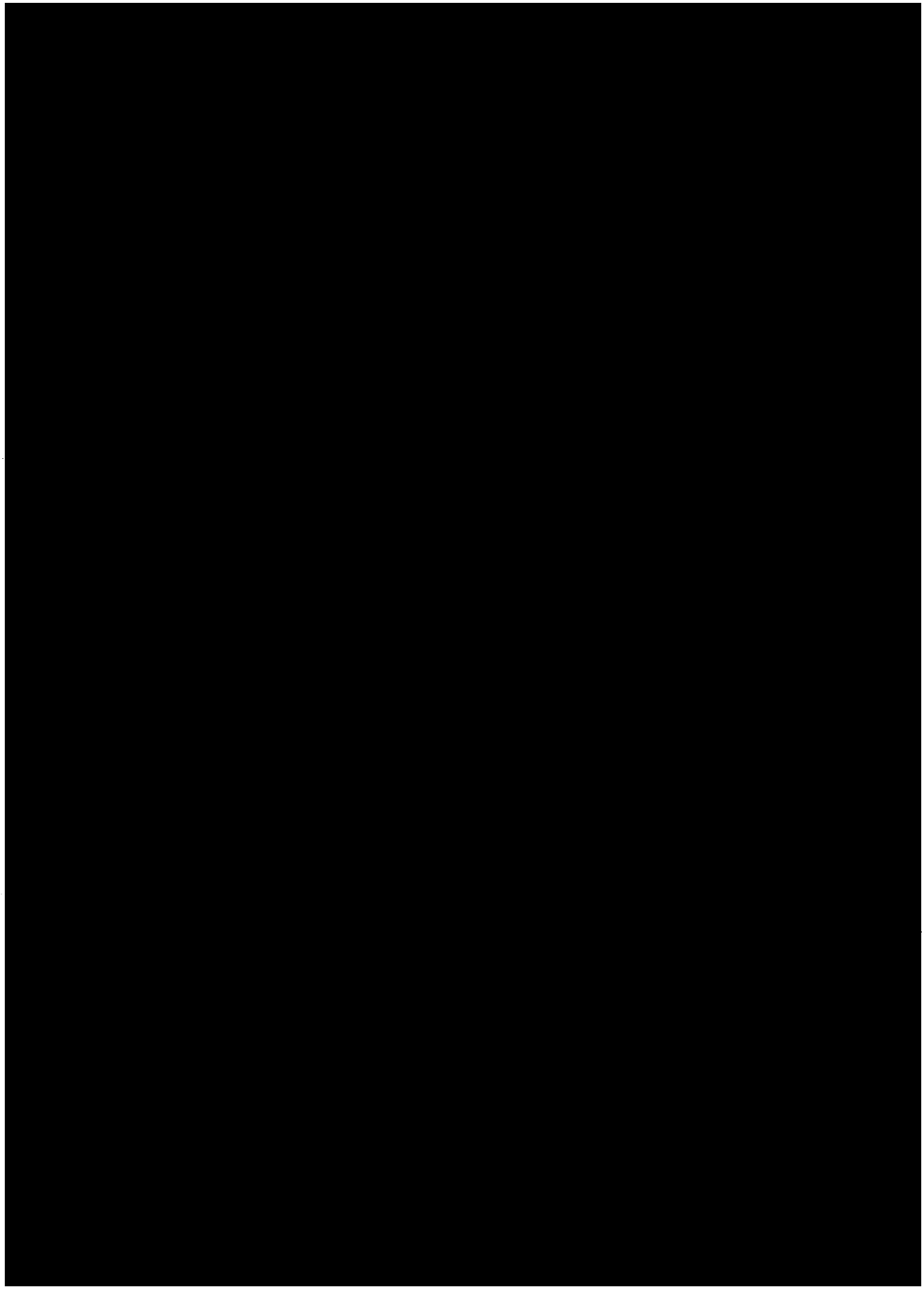


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ATIA - 19(1)

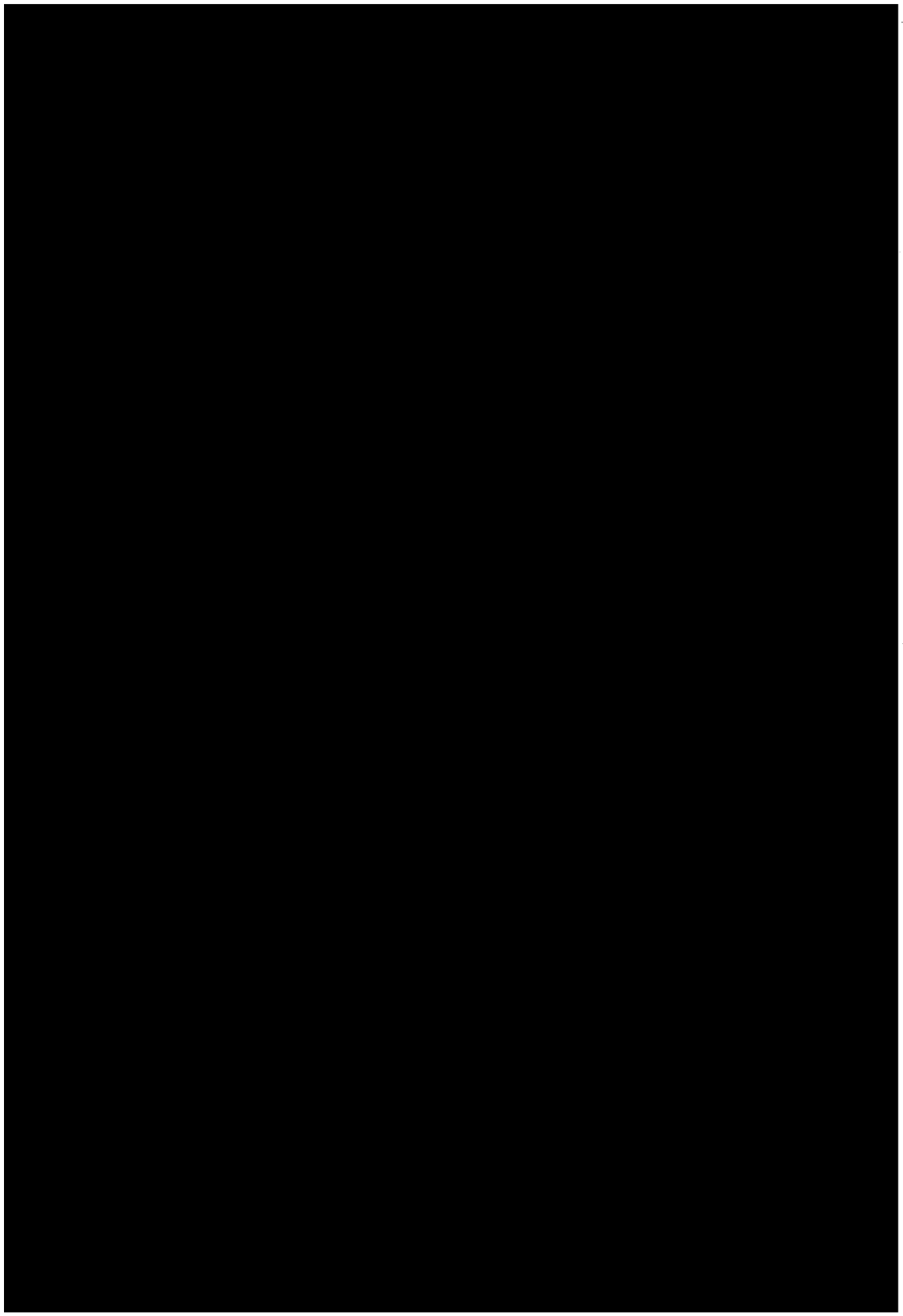


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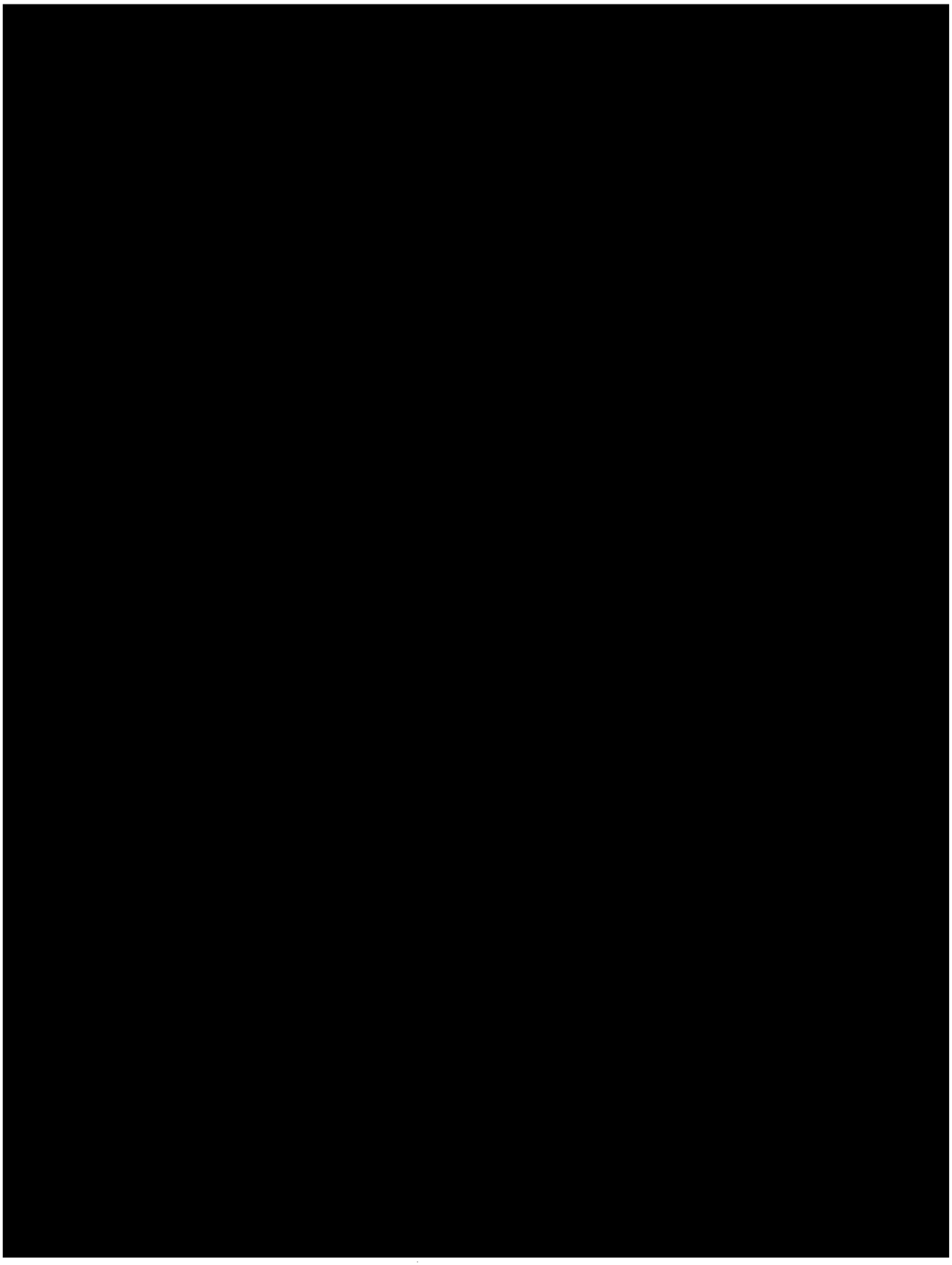
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# Waterfront Toronto
# Financial Reporting

Inter-Governmental Steering Committee Meeting

September 25, 2017

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# Agenda

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- 2017/18 Corporate Plan Performance Report
- Borrowing Update
- Enterprise Resource Planning (ERP) Update



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# 2017/18 Corporate Plan Performance

WATERFRONTToronto

The Corporate Plan is monitored and formally reported to Waterfront Toronto's Finance, Audit and Risk Management Committee (FARM) and Board on a quarterly basis.

The most recent update reflects the quarter end results to June 30, 2017 and these are summarized as follows:

- Key Deliverables - Overall the Corporation is on target to achieve 15 out of 18 key deliverables as per approved 2017/18 corporate plan.
- Budget - Overall the Corporation is forecasting an investment of 120% of its total 2017/18 Capital Investment Plan ($162.3 million vs. $ 134.8 million, exclusive of government flow throughs). The increase of $27.5 million in investments being driven by:
  - Addition of two new deliverables i.e. Port Lands Flood Protection and Enabling Infrastructure Implementation and Broadview and Eastern Flood Protection aggregating $36 million partly offset by;
  - Lower project spends for the Cherry Street Stormwater & Lakefilling project and The Bentway caused by shifts in construction phasing schedules between fiscal years 2016/17, 2017/18 and 2018/19. 2017/18
- Revenues - Overall the Corporation is on track to realize 111% of planned revenues ($88.5 million vs. $80 million per Corporate Plan, exclusive of government flow throughs). The favorable variance is due largely to new funding for Port Lands Flood Protection and Enabling Infrastructure project.



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# Borrowing Update

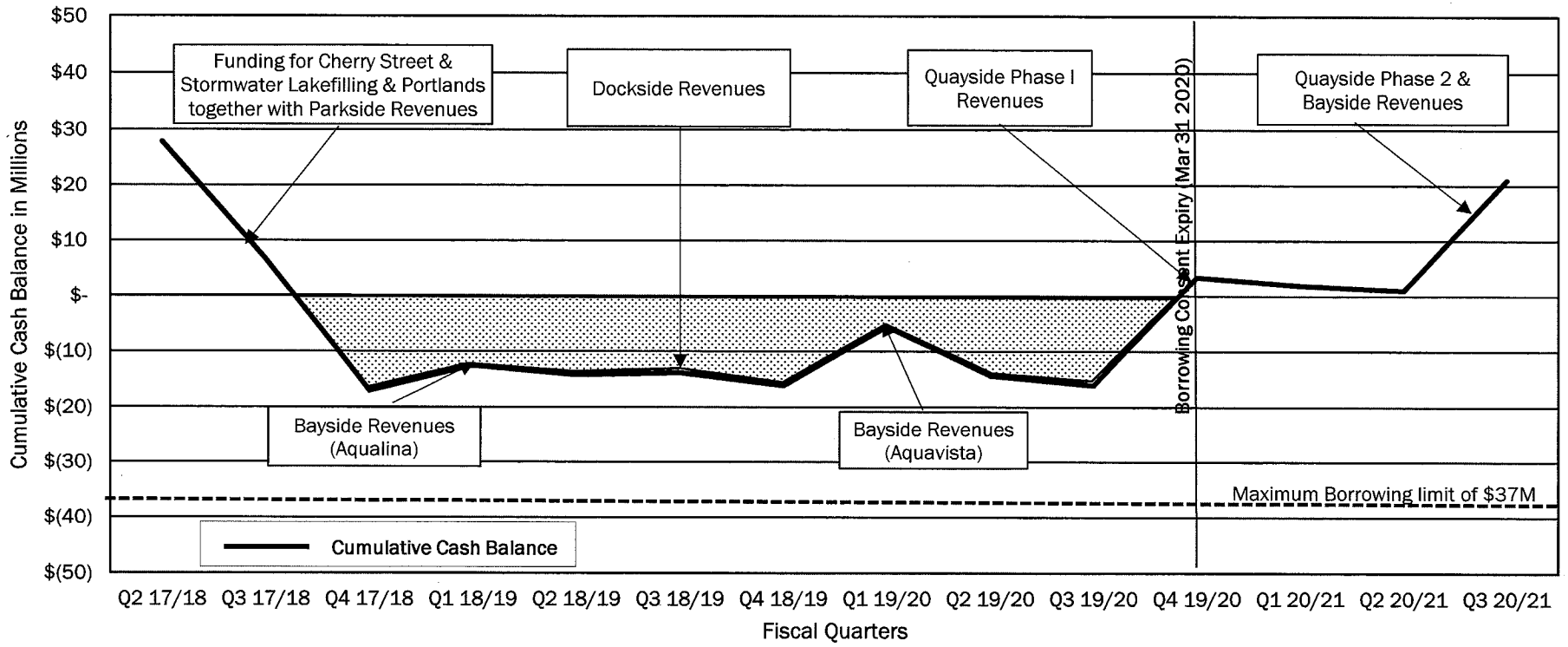
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- In August, 2015 Waterfront Toronto received tri-government consent to borrow up to $40 for a term not to exceed beyond March 31, 2020.
- Waterfront Toronto secured a loan facility from CIBC of up to $40 million at a rate of prime less 0.25% (2.7%), mortgaging WT-owned lands (such as Quayside) as security.
- WT has drawn down on the facility only once in late 2015 (fully repaid).
- WT is in compliance with all reporting and financial covenants associated with this credit agreement.
- Waterfront Toronto forecasts cash flows over 42 months (currently to December 2021) to reflect the period when the Corporation would have realized sufficient revenues to repay the borrowing and meet all of its obligations.
- The next forecasted borrowing requirement is projected in Q4 2017/18 totaling approximately $17 million with full repayment anticipated by Q4 2019/20.
- The available borrowing limit is reduced from $40 million to $37 million is as a result of a $3 million Letter of Credit (LC) issued to the Department of Fisheries and Oceans for the Cherry Street Stormwater and Lakefilling project.
- The borrowing is primarily required for certain non-government funded projects (such as land acquisitions, stormwater infrastructure and Bayside water's edge infrastructure) revenues for which are expected to be realized in future years.



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# Cash Flow Forecast July 2017 to December 2021




| In $ Millions | Q2 17/18 | Q3 17/18 | Q4 17/18 | Q1 18/19 | Q2 18/19 | Q3 18/19 | Q4 18/19 | Q1 19/20 | Q2 19/20 | Q3 19/20 | Q4 19/20 | Q1 20/21 | Q2 20/21 | Q3 20/21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash Inflow | 15.1 | 26.8 | 28.3 | 33.4 | 14.2 | 23.9 | 34.0 | 16.3 | 2.6 | 2.1 | 36.7 | 0.8 | 0.1 | 45.7 |
| Cash Outflow | 26.3 | 48.0 | 51.9 | 28.9 | 15.9 | 23.5 | 36.3 | 5.7 | 11.4 | 3.8 | 17.2 | 2.2 | 1.0 | 25.7 |
| Net Cash Change | (11.2) | (21.3) | (23.6) | 4.5 | (1.7) | 0.4 | (2.3) | 10.6 | (8.8) | (1.7) | 19.5 | (1.5) | (0.9) | 20.0 |
| Balance | 27.9 | 6.6 | (17.0) | (12.5) | (14.2) | (13.8) | (16.1) | (5.5) | (14.3) | (16.1) | 3.4 | 1.9 | 1.0 | 21.0 |

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# Enterprise Resource Planning (ERP) Update

## Background

As a part of its commitment to continuous improvement to enhance operational effectiveness, Waterfront Toronto (WT) is implementing an integrated Cloud based Enterprise Resource Planning (ERP) System in 2017/18 to replace its existing ERP system, which has reached its end of life. The new ERP system called Microsoft Dynamics 365 (D365) will support organizational resiliency by transforming our business processes, providing an intelligent, mobile set of streamlined system, project and financial management tools that provide real-time dashboard – based information for analysis and decision-making at all levels of the Corporation.

## Key features

Some of the key features of D365 are as follows:

- Cloud enabled Software-as-a-service solution;
- Out of the box solution with no customizations;
- Scalable to growth and supports performance measurement-based reporting;
- Seamless integration with other Microsoft applications;
- Mobile friendly integrated solution.

## Implementation timeline

WT is kicking off its ERP implementation on September 20, 2017 with a robust implementation schedule stretching over six months starting September 25, 2017 with all modules expected to go-live by April 2018. The implementation also includes end user ERP training to ensure Corporation wide acceptance of the solution and thereby increase effectiveness and productivity.

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20 Bay Street, Suite 1310
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# Intergovernmental Steering Committee

## Quayside Project Update

*January 25, 2018*

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# Background

WATERFRONTtoronto

Waterfront Toronto's Board has created a subcommittee called the Quayside Committee to oversee the Quayside project. On January 17, 2018 the committee met to review the following:

- City Staff Report on Sidewalk Toronto
- Draft Protocol for Briefing Government's (subject to approval by WT Board of Directors)
- Master Innovation and Development Plan (MIDP) Project Management Structure
- Approach to developing Public Consultation and Engagement Plan
- Proposed Digital Strategy Advisory Committee
- Plan Development Agreement
- MIDP Targets
- Potential Early Pilot Projects



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# City Staff Report on Sidewalk Toronto

WATERFRONTToronto

On December 8, 2017, City Council requested a report to the January 24, 2018 Executive Committee meeting on the agreement between Waterfront Toronto and Sidewalk Labs, including an analysis of the key issues and City Council approval requirements. The report outlines the following:

- The City Council approvals to be applied to the Quayside site
- Intent of The Deputy City Manager to report back when WT and Sidewalk Labs have negotiated a relationship for the MIDP
- The required preparation of a Business Implementation Plan
- Key issues to be addressed – i.e. Data Privacy
- Proposed early pilot project ideas
- WT and Sidewalk Labs commitment to engage with City divisions and agencies through the Waterfront Secretariat



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# Protocol for Briefing Government's

## (Draft for approval by WT Board of Directors)

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- Waterfront Toronto shall consult with each of the three government stakeholders (federal, provincial and municipal) in respect of the Key Agreements

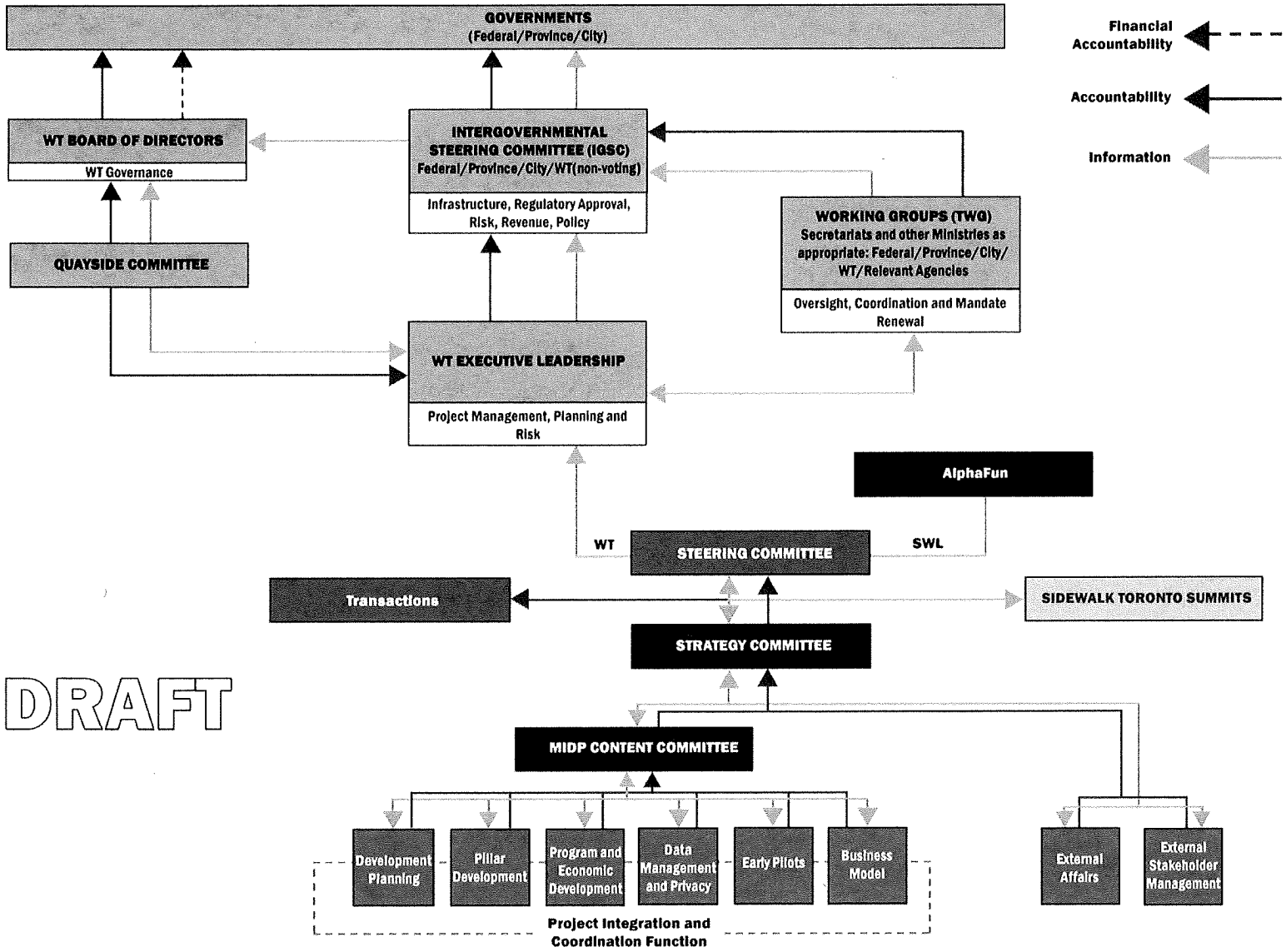
- The Key Agreements include:
  - the Plan Development Agreement;
  - the Land Methodology (as defined in the Framework Agreement);
  - the Implementation Agreement;
  - the Collaboration Agreement; and
  - any other agreements deemed material by the Quayside Committee



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# MIDP Project Management Structure
## (Draft For Discussion)

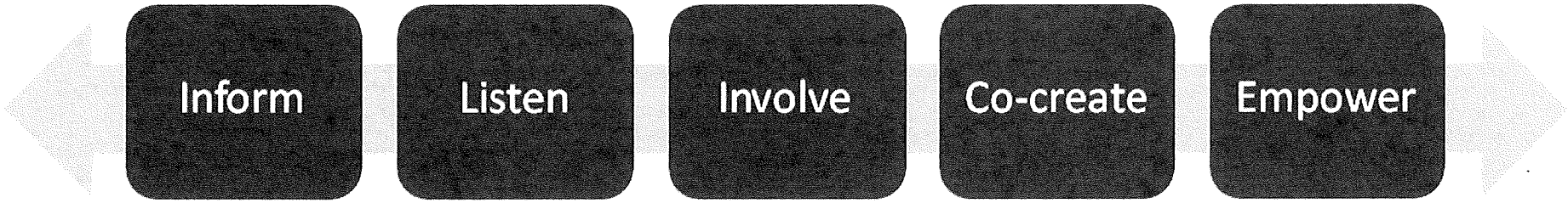
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# Approach to developing Engagement Plan: Community Engagement Spectrum

WATERFRONTtoronto



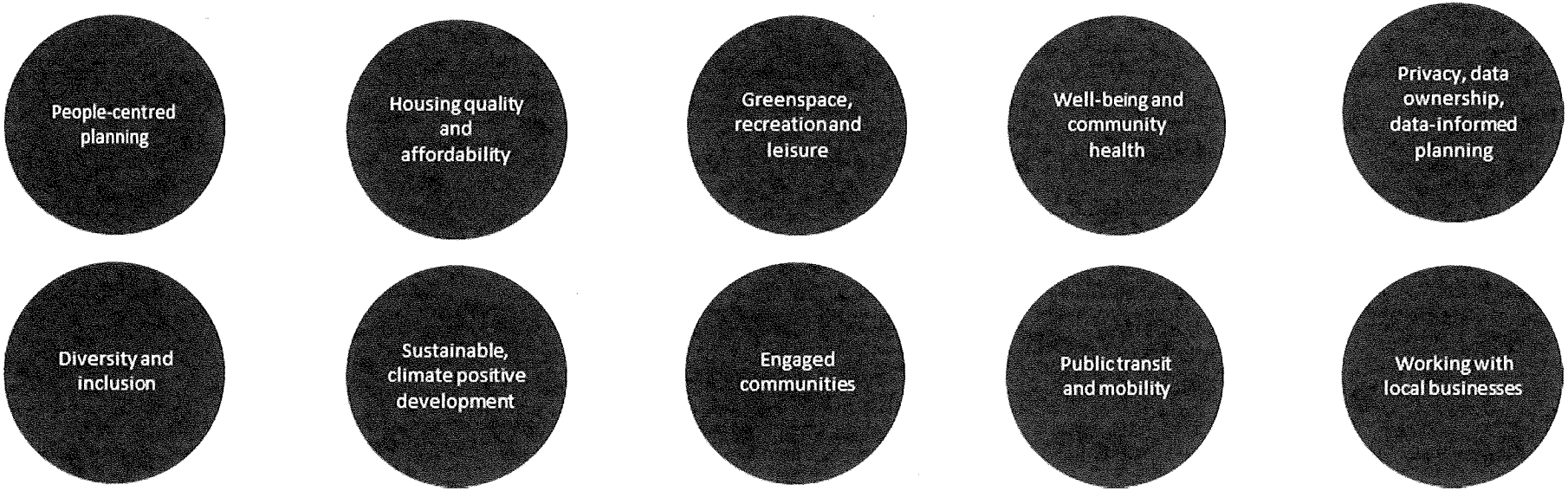

| Inform | Listen | Involve | Co-create | Empower |
|---|---|---|---|---|
| *Providing relevant and objective project information* | *Collecting feedback and also ideas, stories and concerns* | *Open and honest dialogue that informs the project and explores a range of possibilities and outcomes* | *Partnering with communities in an on-going and interactive process of planning, decision making and co-creation* | *Providing support, enabling residents to define key issues and create the solutions. Residents lead and control the process.* |
| Examples: | | | | |
| • Public talks<br>• Information sessions | • Comment walls<br>• Neighbourhood meetings | • Pop-up stations<br>• Design charrettes | • Advisory panels and working groups<br>• Civic Labs<br>• Tech challenges | • Partner with community organizations<br>• Community-based mentorship |

*DRAFT – January 17, 2018*



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# Engagement Plan: Town Hall Feedback Themes






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# Proposed Digital Strategy Advisory Panel

WATERFRONToronto

The Quayside Project has complex digital governance issues that require an advisory group of subject matter experts. We are forming an independent group that will advise Waterfront Toronto (Management and the Board) on key areas of digital governance, including, but not limited to:

- Privacy
- Cybersecurity
- Data
- Cyber ethics
- Intellectual Property
- Architecture
- Service Levels/Business Terms



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# Plan Development Agreement

WATERFRONToronto

The Plan Development Agreement (PDA) will govern the planning phase and the parties' relationship in creating the MIDP. The agreement will include five Schedules:

a) MIDP Budget
b) MIDP Scope and Timeline
c) BIP Outline
d) Procurement
e) Land Valuation Methodology



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# Potential Early Pilot Projects

WATERFRONTtoronto

To demonstrate some of the ambitions presented in Sidewalk Labs' Vision document, Sidewalk Labs has proposed a series of early pilots to inform the conversation on what is possible on the larger scale Quayside development.

AV Shuttle

- Set up an autonomous shuttle service to and from downtown Toronto and Cherry Beach to create an exciting transit experience for Torontonians and begin putting driverless technology to work for the public good.

Dynamic Curbs

- Test technology to make regulations flexible in real time and thereby enable the curb to prioritize different needs and uses throughout the day, maximizing utility and improving flow.

Smart Chute

- Implement pay-as-you-throw waste programs in multi-family settings to improve rates of diversion.



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# Next Steps

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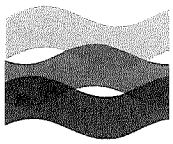
- Negotiate the Plan Development Agreement with Sidewalk Labs. The first step will be the Land Methodology
- Finalize and release Public Consultation and Engagement Plan, anticipated for the end of January
- Convene Inaugural Data Strategy Advisory Group
- Further develop an approach for the potential early pilots



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**November 1st, 2017**

# Innovation and Funding Partner Framework Agreement
# Summary of Key Terms
# For Public Disclosure



WATERFRONTToronto

## Overview

As a result of Waterfront Toronto's Request for Proposals No. 2017-13, Waterfront Toronto has selected Sidewalk Labs as its Innovation and Funding Partner to work jointly on plan for a new kind of district on Toronto's Eastern Waterfront – one that will combine forward-thinking urban design and new digital technology to achieve precedent-setting levels of sustainability, affordability, mobility and economic opportunity. The Framework Agreement entered into by Waterfront Toronto and Sidewalk Labs sets forth the basic terms and fundamental principles to guide that working relationship. It contemplates an initial joint planning process, which Sidewalk Labs will commit up to US$50 million to fund, that will occur over the next 12 months. The result of that planning process is expected to be a Master Innovation and Development Plan (MIDP), which if approved by the Boards of Directors of Sidewalk Labs and Waterfront Toronto, and with applicable government approvals, will be followed by a long-term joint effort to realize the shared vision.

The Framework Agreement contemplates a collaborative relationship in the creation of the MIDP, which will outline how to achieve this new kind of district on Quayside and the Eastern Waterfront, and which will be informed by meaningful public engagement. The governance of this relationship includes a Project Management Committee that consists of an equal number of senior representatives of Sidewalk Labs and Waterfront Toronto, including their respective CEOs. The governance relationship between the parties will be elaborated in future agreements between the parties.

The Framework Agreement also contemplates that:

- Sidewalk Labs will facilitate the commitment from Alphabet Inc. to move Google's Canadian headquarters to provide an initial anchor tenant to the waterfront, subject to the MIDP.
- Sidewalk Labs and Waterfront Toronto will seek to incorporate into the MIDP innovative approaches for financing affordable housing which are expected to meet or exceed the affordable housing commitments already made by Waterfront Toronto on Quayside.
- The parties will work to incorporate the establishment of an Urban Innovation Institute in the MIDP as a secondary anchor tenant for the site.

While the Framework Agreement outlines guiding principles for the parties' relationship, many of the details will be further defined through additional discussions and future agreements as the partnership progresses over the course of the next year. This incremental planning process was designed to recognize the complexity of the endeavor, the necessity of extensive stakeholder and community engagement, and the need to incorporate feedback as the plan takes shape. Accordingly, Sidewalk Lab's capital commitments for the planning process correspond to stages of collaboration, with expenditures incrementally increasing as the parties' shared vision and integration grows.

More specifically, the Framework Agreement provides for the funding of up to US$10 million by Sidewalk Labs prior to the achievement of certain "initial plan milestones," and the funding of up to an additional US$40 million by Sidewalk Labs between the achievement of those initial plan milestones and the approval of the MIDP. The initial plan milestones that trigger the incremental US$40 million commitment are:

- execution of contribution agreements representing governments' commitment of CAN$1.25 billion to complete the Port Lands flood protection;
- re-affirmation of Waterfront Toronto's existing mandate for the planning and development of the Eastern Waterfront;

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- alignment of the parties on the scope of a Business and Implementation Plan as required by City Council;
- alignment of the parties on the scope of the MIDP; and
- agreement by Waterfront Toronto and Sidewalk Labs on fair and arms'-length procurement standards for any future procurements.

The Framework Agreement permits either party to terminate the agreement in certain circumstances, including if the initial plan milestones are not achieved within approximately six months, or if the MIDP is not approved within approximately 12 months. Waterfront Toronto also has a unilateral right to terminate the agreement prior to the completion of stage 1. The Framework Agreement does not itself provide any rights in land or any rights to develop land.

---

### Parties

The signatories are (1) Toronto Waterfront Revitalization Corporation ("Waterfront Toronto"), (2) Sidewalk Labs LLC (together with its affiliates "Sidewalk" or "Sidewalk Labs") and (3) Sidewalk Toronto, Limited Partnership, which will be the entity through which Waterfront Toronto and Sidewalk will collaborate to create the MIDP for Quayside and the Eastern Waterfront.

### MIDP and Collaboration on the MIDP

When the planning work contemplated in the Framework Agreement is completed, the result will be a Master Innovation and Development Plan (MIDP), which will be a comprehensive plan for the urban design, technology, infrastructure, and strategies needed to achieve the parties' vision for sustainability, affordability, mobility, and economic development for Quayside and the Eastern Waterfront. The parties also plan to continue to develop a thoughtful "Privacy by Design" policy to be incorporated into the MIDP, which will ensure compliance with applicable privacy laws and take into account community input.

Waterfront Toronto and Sidewalk Labs commit to collaborate with one another in good faith to jointly develop the MIDP within the timeframes contemplated by the Framework Agreement.

Any subsequent implementation of the MIDP is subject to the parties' mutual approval of such MIDP. This includes approval of the MIDP by Waterfront Toronto's Board of Directors

### Site

The Framework Agreement itself does not commit any lands for development - only to conceive an innovative plan for urban design, technology, infrastructure, and strategies to achieve the parties' vision for sustainability, affordability, mobility, and economic opportunity. For the purposes of that planning work, there will be two sites included in the planning work of the MIDP: (i) Quayside which is the area bounded by Lakeshore Boulevard on the north, Bonnycastle Street on the west, Queens Quay Boulevard and its future extension to the south, and including 333 Lake Shore Boulevard East on the east and any developable lands created by any road realigned within the Quayside boundaries, and excluding any lands not publicly owned; and (ii) the Eastern Waterfront which is the area bounded by the Inner Harbour on the west, Keating Channel and Lake Shore Boulevard to the north, Lake Ontario to the south, and Leslie Street to the east. See map attached.

Quayside is the site on which the parties expect to first pilot the technologies and strategies included in the MIDP.

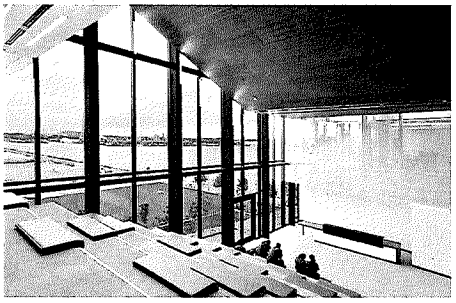
### Stages

The Framework Agreement contemplates four planning stages:

Stage 0: This stage began with Waterfront Toronto's selection through a competitive RFP process of Sidewalk Labs as its selected Proponent, and included contract negotiations and the development of the Framework Agreement. This stage ended with the execution of the Framework Agreement on October 16, 2017.

Stage 1: Started upon signing the Framework Agreement and will end with the satisfaction of the following three conditions (1) the signing of a Plan Development Agreement to provide a work plan for

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creating the MIDP, (2) agreement on a Development Plan Budget for anticipated expenses during stages 1-3, and (3) agreement on a methodology for the valuation of any future transfers of land.

Stage 2: Starts at the end of stage 1 and ends upon the achievement of the initial plan milestones as set out above. These are targeted to be completed by the Spring, 2018.

Stage 3: Starts at the end of stage 2 and ends upon finalization and approval or rejection of the MIDP which will require Board approval of both Sidewalk Labs and Waterfront Toronto. If the MIDP is approved, an Implementation Agreement and Collaboration Agreement, and perhaps other agreements, will then be executed by the parties to govern the longer-term relationship and implementation of the MIDP. This stage is targeted to be completed by Fall, 2018.

### Government Approvals

The implementation of the MIDP will require that the parties first obtain all necessary approvals from the City of Toronto, the Province of Ontario, the Canadian federal government, and other agencies or entities as required. The agreement by Waterfront Toronto and Sidewalk Labs on the MIDP will not itself result in the grant of any such approvals.

### Capital Commitments

As described above, Sidewalk will provide a capital commitment of up to US$50 million to fund the creation of the MIDP.

### Fair Procurement Standards

As noted above, one of the initial plan milestones is the parties' agreement on fair and arms'-length procurement standards that are consistent with Waterfront Toronto's principles of openness and fairness in procurement.

### Google Canadian Headquarters

In the Framework Agreement, Sidewalk agrees to facilitate the commitment from Alphabet Inc. to move Google's Canadian headquarters to the waterfront to provide an initial anchor tenant, subject to the MIDP.

### Local Venture Investments

The Framework Agreement also contemplates that the parties will seek to source investment opportunities in innovative Canadian companies.

### Affordable Housing Trust

The Framework Agreement provides that Waterfront Toronto and Sidewalk will seek to incorporate into the MIDP innovative approaches for financing affordable housing.

### Urban Innovation Institute

The Framework Agreement also provides that the parties will work to incorporate the establishment of an Urban Innovation Institute in the MIDP as a secondary anchor tenant for the site.

### Economics

The Framework Agreement contemplates agreement of the parties on a Development Plan Budget for the anticipated expenses of the project.

### Development

The selection of Sidewalk as the successful proponent under Waterfront Toronto's Request for Proposals 2017-13 has resulted in the selection of a partner to develop a plan that will combine forward-thinking urban design and new digital technology to achieve precedent-setting levels of sustainability, affordability, mobility and economic opportunity as will be set out in the MIDP. Request for Proposals 2017-13 did not result in the selection

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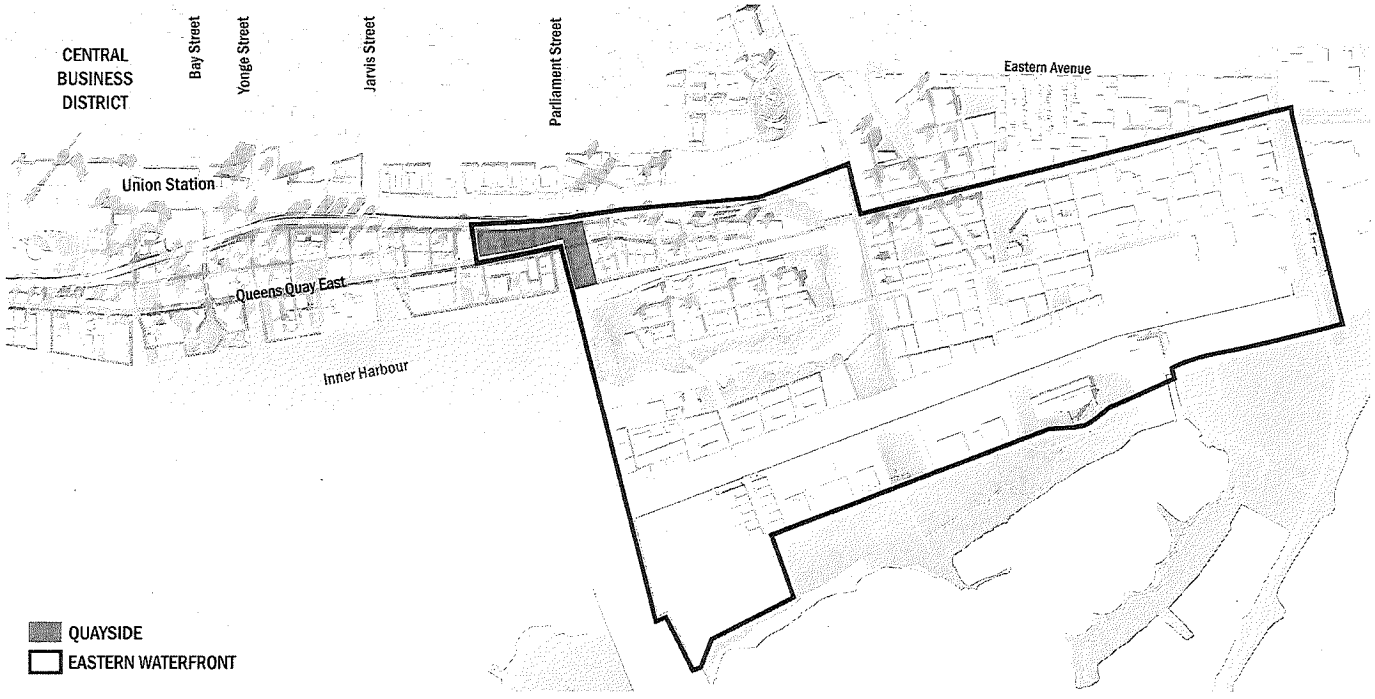
of a development partner for the development of individual parcels of land. Rather the MIDP will provide an overlay plan of infrastructure and strategies to achieve the shared vision of Sidewalk and Waterfront Toronto that will be imposed on developers when they are selected in the future to develop the lands. The way in which the infrastructure and technologies will actually be delivered and financed (including legal structures) has not been determined at this time and will be given further definition in the MIDP.

## Public Engagement

The planning work contemplated by the Framework Agreement that will result in the MIDP will be developed with robust consultation based on questions, concerns and ideas generated from open and transparent public engagement that has been the high standard of all of Waterfront Toronto's work to date.

## Non-Disclosure of the Framework Agreement

The Framework Agreement contains a requirement that it be kept confidential. However, in the interest of transparency, the Waterfront Toronto and Sidewalk Labs' have agreed, to release this summary while the they continue to work together to address commercial terms during Stage 1.






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# We want you to join us to imagine a new kind of neighbourhood taking shape on Toronto's waterfront.

Toronto is one of the world's most inclusive and successful cities, but like most growing urban centres, it is also facing real challenges: **Congestion. Affordability. Climate Change.**

Our hope is to explore new ideas for solving these challenges while creating a healthier, more inclusive, and sustainable approach to urban living.

We also know that neighbourhoods like Quayside are too important and too complex to be designed in isolation. The more voices, perspectives, and ideas that come to the table, the better. That's why we want you to be a part of this project and why we are planning dozens of different meetings and events over the next several months.

We hope to see you soon!

**Will Fleissig**
President & CEO, Waterfront Toronto

Dan Doctoroff
Chairman & CEO, Sidewalk Labs



## What is Sidewalk Toronto?

Sidewalk Toronto is a joint effort by Waterfront Toronto and Sidewalk Labs to create a new kind of mixed-use, complete community on Toronto's waterfront. Sidewalk Toronto will combine forward-thinking urban design and new digital technology to create a people-centred neighbourhood that achieves precedent-setting levels of sustainability, affordability, mobility, and economic opportunity.

## How did this start?

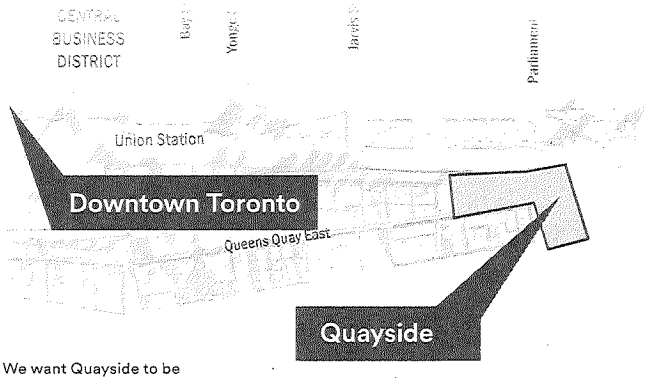
Sidewalk Labs responded to a competition issued by Waterfront Toronto to identify an innovation and funding partner for a new place called Quayside. Several local and international firms submitted responses, describing their vision, implementation plan, team strength and experience, and financial and technical capacity. Following a rigorous evaluation process, Waterfront Toronto selected Sidewalk Labs as its partner.

## What happens next?

Our public consultation and stakeholder engagement will inform and help shape Sidewalk Toronto's Master Innovation and Development Plan, including public policy and regulatory impacts. This work will proceed throughout 2018. The Plan will be subject to approval by the boards of both Waterfront Toronto and Sidewalk Labs. Its implementation will require a variety of municipal and governmental approvals.

## What do we hope to achieve?

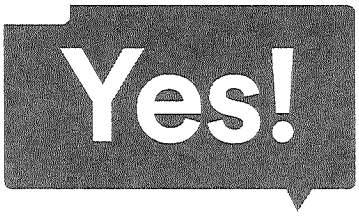
- Establish a complete community that improves quality of life for a diverse population of residents, workers, and visitors.
- Create a destination for people, companies, startups, and local organizations to advance solutions to the challenges facing cities, such as energy use, housing affordability, and transportation.
- Make Toronto the global hub of a rising new industry: urban innovation.
- Serve as a model for sustainable neighbourhoods throughout Toronto and other cities.




We want Quayside to be a vibrant and complete community that welcomes residents, businesses, and visitors alike.

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Community engagement?
Collaboration?
Co-creation?




We want to imagine this new neighbourhood together. This means working in partnership with Torontonians from across the city, as well as many community organizations, different stakeholders, and our government partners to show what's possible when people think and work together.

---

## Here's what we care about:

**INCLUSION** We will create extensive, innovative opportunities to hear from Torontonians in every corner of the city and we welcome the city's rich diversity of perspectives, identities, and backgrounds. Our commitment to inclusion will be a hallmark of our work.

**CREATIVITY** We are passionate about creativity and the inventiveness that makes cities so vibrant. We will seek out and share great ideas at home and abroad and champion the creative energy of all Torontonians.

**LEARNING** We think learning starts by listening — carefully and closely. This means developing our plan in conversation with Torontonians, and ensuring that at every stage it considers and reflects the sensibilities and aspirations of residents and stakeholders, as well as our government partners.

**RELATIONSHIPS** We are serious about building close relationships with community partners. If we nurture and invest in these relationships, our plans for this neighbourhood will be better and the community will be stronger too.

**EQUITY** We understand that people and communities can face barriers to participating in some public dialogues. We are committed to reaching out to and supporting the participation of those who are historically underrepresented.

**PLAY** We think people can solve tough challenges while also having fun. That's why we will create surprising, unexpected, and inventive ways to imagine Toronto's newest neighbourhood and explore the future of Toronto's waterfront.

Records Review as a Part of Routine Access & Information

# Public talks, design jams, local pop-ups, neighbourhood meetings, roundtable workshops, tech competitions, a waterfront pavilion, a travelling fellowship, kids camps, and civic labs...

## There are lots of different ways you can get involved!

1. **Attend one of our live-streamed public talks featuring acclaimed speakers on topics such as sustainability, digital technologies, mobility, urban design, and inclusion**

   *Why attend?* If you're interested in learning what other cities are doing to prepare for the future, you will want to attend our series of public talks that will feature special dialogues with leading researchers, writers, architects, technologists, ethicists, and planners.

2. **Join a public roundtable meeting during key phases in the creation of the development plan**

   *Why participate?* If you want to help shape our thinking and be kept up-to-date on how our plan unfolds, you will want to participate in one of our public roundtable meetings. Working in small, facilitated groups, you'll hear an update on our progress, learn about the thorny issues we're working to resolve, and help to challenge our assumptions and refine our thinking.

3. **Attend a neighbourhood meeting held throughout Toronto in partnership with local organizations and community associations**

   *Why attend?* If you want to learn more about our plans and share your ideas you can attend a neighbourhood meeting that's close to home, and if you're part of a community association, you can also invite us to visit your neighbourhood and host a conversation with us.

4. **Visit the Sidewalk Toronto Pavilion opening later this year**

   *Why visit?* Our Sidewalk Toronto Pavilion will be a place to learn more about the technologies that are changing urban life, experience cultural programming, explore the history and future of Toronto's waterfront, and engage with interactive exhibits and workshops that will help to shape our development plan.

5. **Visit a local pop-up station to learn about our project and share your ideas**

   *Why visit?* If you don't have time to make it to one of our events or visit our Sidewalk Toronto Pavilion, watch for us to pop up in a community location near you. These will be great opportunities to quickly learn about Sidewalk Toronto and share your ideas for improving Toronto's waterfront.

6. **Watch your mailbox for an invitation to serve on the Sidewalk Toronto Reference Panel to provide planning and policy guidance along with residents from across the city**

   *Why serve?* We believe it's important that a wide range of voices from across the city help to develop a vision and specific goals for our plan. We will be inviting households across the city to consider volunteering to serve on a 36-member Reference Panel that will meet over six Saturdays throughout the year to examine our work and help shape our thinking.

7. **Attend a design jam to examine specific elements of the Sidewalk Toronto plan**

   *Why attend?* If you have a keen eye for the design of public space or have ideas for improving the architecture and area plan, you will want to attend one of our charrettes to work alongside architects and planners as they review and workshop different design elements.

8. **Go online to learn about Sidewalk Toronto, watch our videos, review documents, and complete surveys**

   *Why visit?* We are passionate urbanists who want to share what we are learning about the future of cities and Toronto's waterfront. Throughout the year we'll be posting new content to our website (sidewalktoronto.ca) where you can read about our approach, learn from leading urban planners and technologists, register for a public session, or complete one of several project surveys.

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9. **Sign-up for our CivicLabs to examine the future of issues like mobility, housing, and inclusion**

*Why volunteer?* If you're interested in working on some of the biggest challenges facing cities, you will want to volunteer to attend one of our two-day CivicLabs. Working with leading designers alongside other Torontonians, you will have the opportunity to explore one of several topics in close detail, develop a series of scenarios, and brainstorm a range of possible solutions that can be piloted by Sidewalk Toronto.

10. **Send your child, ages 9-12, to a free YMCA-Sidewalk Toronto Summer Kids Camp to learn about the waterfront and explore ideas for its future**

*Why register?* If you have children ages 9-12 who are interested in how cities work and grow, our weeklong Summer Kids Camp will give them a behind-the-scenes look at Toronto and its waterfront. Based at the new Cooper Koo YMCA, campers will have the opportunity to learn, play, and explore as they develop their own ideas.

11. **Apply for our Sidewalk Toronto Fellows Program for Torontonians, ages 19-24**

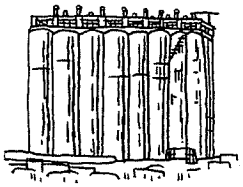
*Why apply?* Twelve fellows will be selected following an application process and travel with us to three international cities over six months to explore the future of cities and technology and prepare a public report.

12. **Join local civic innovators to develop pilots and prototypes to improve urban life**

*Why get involved?* If you are interested in tackling some of the things that frustrate Torontonians and using digital technologies to improve urban life, you will want to get involved with our pilots and prototypes initiative. Working in partnership with members of Toronto's civic innovation, arts, and tech community, you will have the opportunity to develop and propose pilots and prototypes to run with Sidewalk Toronto.

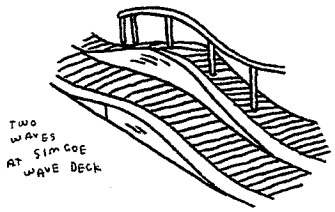
13. **Watch for local and international experts to support our project teams**

*Why is this important?* We think that local and international experts who are independent of either Waterfront Toronto or Sidewalk Labs have a valuable role to play in helping to shape our plan. Small working groups will meet periodically with our project leads throughout the planning process to help strengthen and refine our approach. This will include a dedicated team to advise Sidewalk Toronto on the development of a robust digital governance strategy, reinforce our commitment to open standards, and ensure that the protection of personal privacy is an essential component of digital urban infrastructure. Summaries of their discussions will be made publicly available.




## Here's what we've heard you want to discuss!

- Well-being and community health
- People-centred planning
- Public transit and personal mobility
- Sustainable, resilient, climate-positive development
- Diversity and inclusion
- Housing quality and affordability
- Data-informed decision-making
- Privacy and data governance
- Greenspace, recreation, and leisure
- Engaged communities
- Entrepreneurship and innovation




## Coming in February and March 2018!

### THROUGHOUT FEBRUARY & MARCH

The first in a number of stakeholder advisory panel meetings will take place around important topics such as affordable housing, sustainability, public realm, and privacy.

### FEBRUARY 12

Invitations to join the Sidewalk Toronto Reference Panel are mailed to over 10,000 randomly selected households.

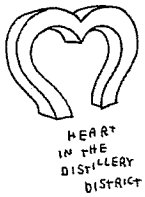



### FEBRUARY 20 – MARCH 9

Applications open for the Sidewalk Toronto Fellows Program.

### FEBRUARY 26

Neighbourhood meetings begin.




### MARCH 1

Enrolment opens for the YMCA-Sidewalk Toronto Summer Kids Camp.

### MARCH 20

The first public roundtable meeting will offer a chance to learn about and provide feedback on the work plan to develop the Sidewalk Toronto Master Innovation and Development Plan.

### MARCH 27

The first Sidewalk Toronto Talk will explore "The Future of Complete Streets."

## Our commitment to inclusion and access

It's our job to remove whatever barriers we can that might make it difficult for you to contribute your voice and perspective. We will provide transit, eldercare, and childcare subsidies as well as modest stipends on request. If there's an event you would like to attend or material you would like to access, and need our assistance, please contact us at hello@sidewalktoronto.ca

## Our commitment to Indigenous engagement

This project offers a unique opportunity to engage in new ways on Indigenous issues with the Mississaugas of the New Credit First Nation. We look forward to working with the Mississaugas of the New Credit First Nation and urban Indigenous communities on this plan.

# Want to know the when, where, and what?

## It's all at sidewalktoronto.ca

Follow us @sidewalktoronto

Join our newsletter at sidewalktoronto.ca

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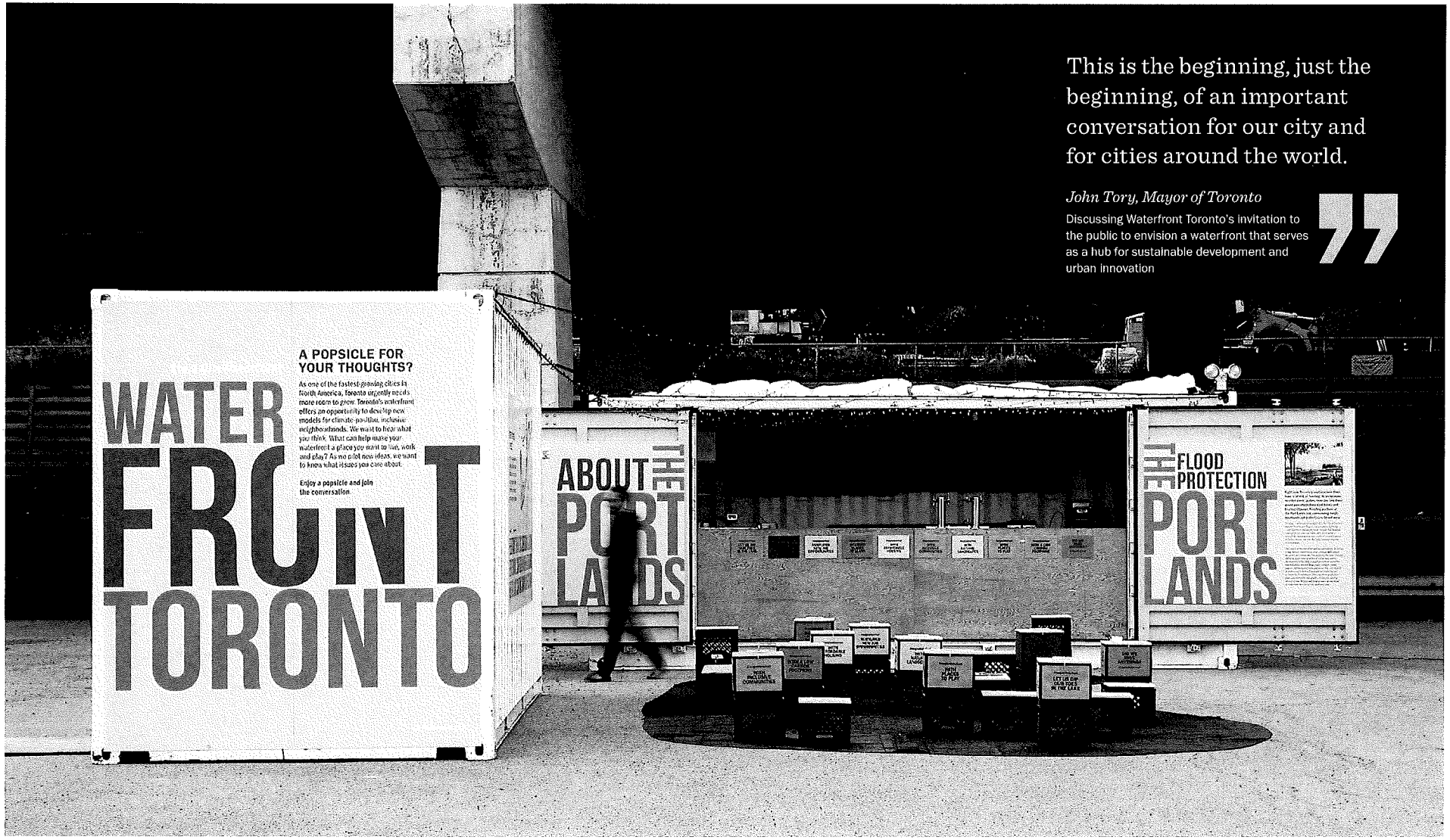


# Corporate Plan 2018/2019

## WATERFRONToronto

Draft–November 30, 2017

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August, 2017: Set-up for a public engagement event designed to inform Torontonians about transformational plans for the Port Lands and invite their input.





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Effective public engagement is essential to creating a thriving waterfront that works for everyone. Consulting meaningfully with Torontonians isn't just a step in the process, it's at the heart of everything we're trying to do.

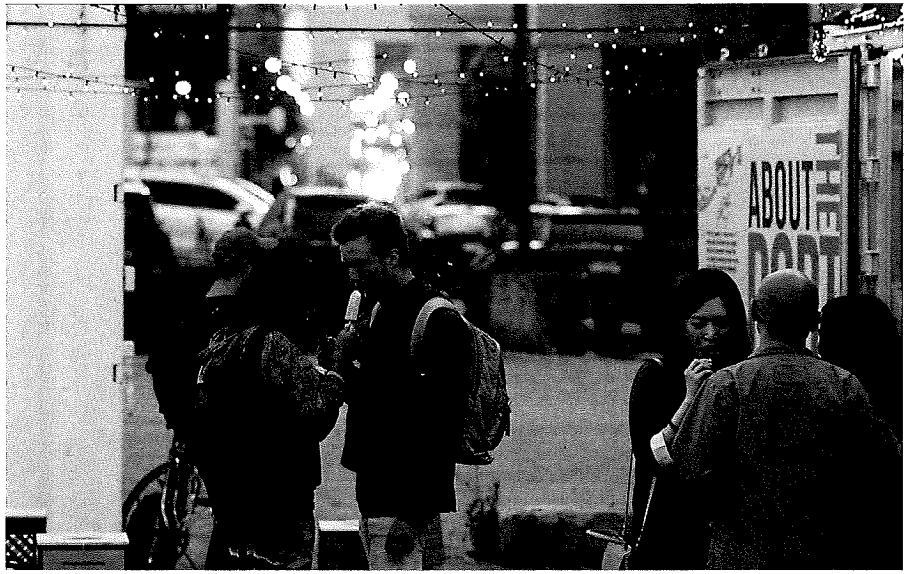
*Will Fleissig, Waterfront Toronto CEO*

Waterfront Toronto CEO Will Fleissig (middle), Sidewalk Labs CEO Dan Doctoroff (right), and moderator Denise Pinto (left) listen to a question at a November, 2017 town hall meeting.





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Members of the public at the pop-up public engagement event about the Port Lands.





# To transform 800 hectares of underutilized former industrial land into beautiful, sustainable mixed-use communities and dynamic public spaces.

*Waterfront Toronto's 25-year mandate*


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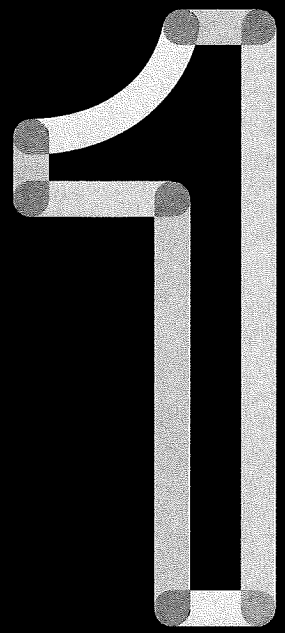
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SECTION 1 / VISION





# Where the city meets the lake

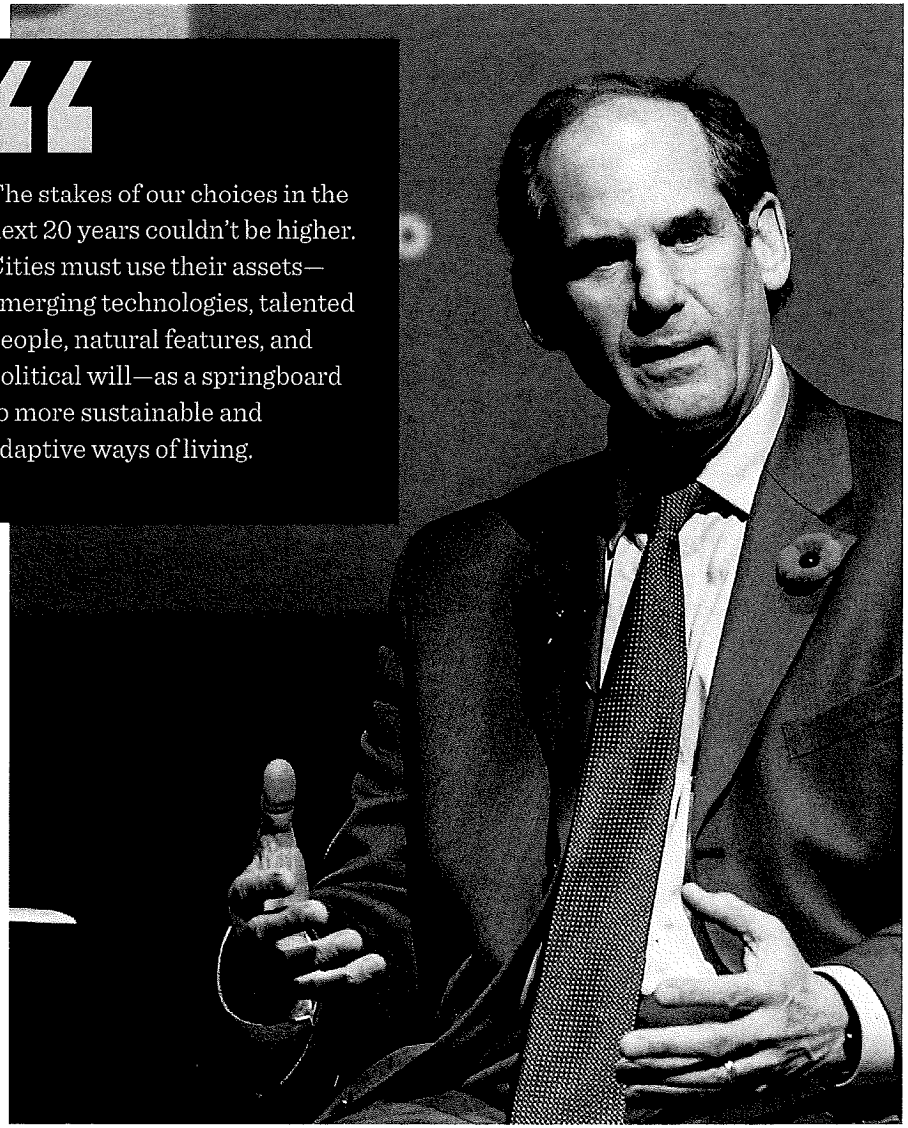
**Waterfront Toronto's vision is of a waterfront that belongs to every Torontonian.**

To realize that vision, we're working hard and listening hard. We're putting extensive and authentic public consultation at the heart of our work, and vetting our infrastructure and environmental plans with the world's top experts. We know that getting the waterfront right means getting it right for everyone.

This section shares perspectives from Waterfront Toronto's CEO and Chair, and lays out some of the strategic ideas that are guiding us as we continue working with Torontonians to make the lakeshore an even more vibrant and connected part of the city.



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Will Fleissig, President & CEO of Waterfront Toronto





# A message from Will

**The urgent challenges cities face today require new models of partnership and collaboration. Whether the goal is responding to climate change, promoting inclusive economic growth, building more affordable homes, enabling mobility, or building social capital, siloed thinking and action can't take us where we need to go.**

We need creative, coordinated action that harnesses the best tools and insights from every sector of our society: residents and businesses, academia and government, designers and technologists.

Waterfront Toronto was built for this. Seventeen years ago, at a very different time in the life of our city, three orders of government entered into an innovative partnership. They formed a new organization mandated to deliver transformative waterfront revitalization through shared investment, cross-sectoral partnerships, and genuine community engagement.

The power--and remarkable prescience—of this model is clear. Waterfront Toronto has delivered 28 kilometres of critical infrastructure, nearly 3,000 new housing units (almost 600 of them affordable), and 90 acres of new parks and public spaces—from Corktown Common in the West Don Lands to the redesigned Queens Quay. Places once abandoned now ring out with the life of the city.

Today, Waterfront Toronto is adding to this fabric of inviting spaces by the lake–and we're also embarking on a new phase of work. We're beginning to advance two transformational projects that urbanists are calling game-changers in the history of the city. Our plan for the Port Lands will unlock enormous economic value while enhancing Toronto's resilience to extreme weather and creating complete communities (see p. 24). And Quayside (Sidewalk Toronto) will use advanced technology and cutting-edge building methods to create the neighbourhood of the future: green, affordable, accessible, and people-centred (see p. 34).

Why this bold new approach, and why now? The stakes of our choices in the next 20 years couldn't be higher. Cities must use their assets—emerging technologies, talented people, natural features, and political will—as a springboard to more sustainable and adaptive ways of living. Our waterfront can be the testing ground for these new ideas, so that the lessons we learn can be applied in neighbourhoods across Canada and around the world.

This moment of urgency and possibility arrives just as Toronto is turning a corner as a mature global city. Uniquely diverse, exceptionally open, and teeming with talent, our city has been attracting notice—not to mention people and investment—as a centre of energy and optimism at a time of widespread uncertainty.

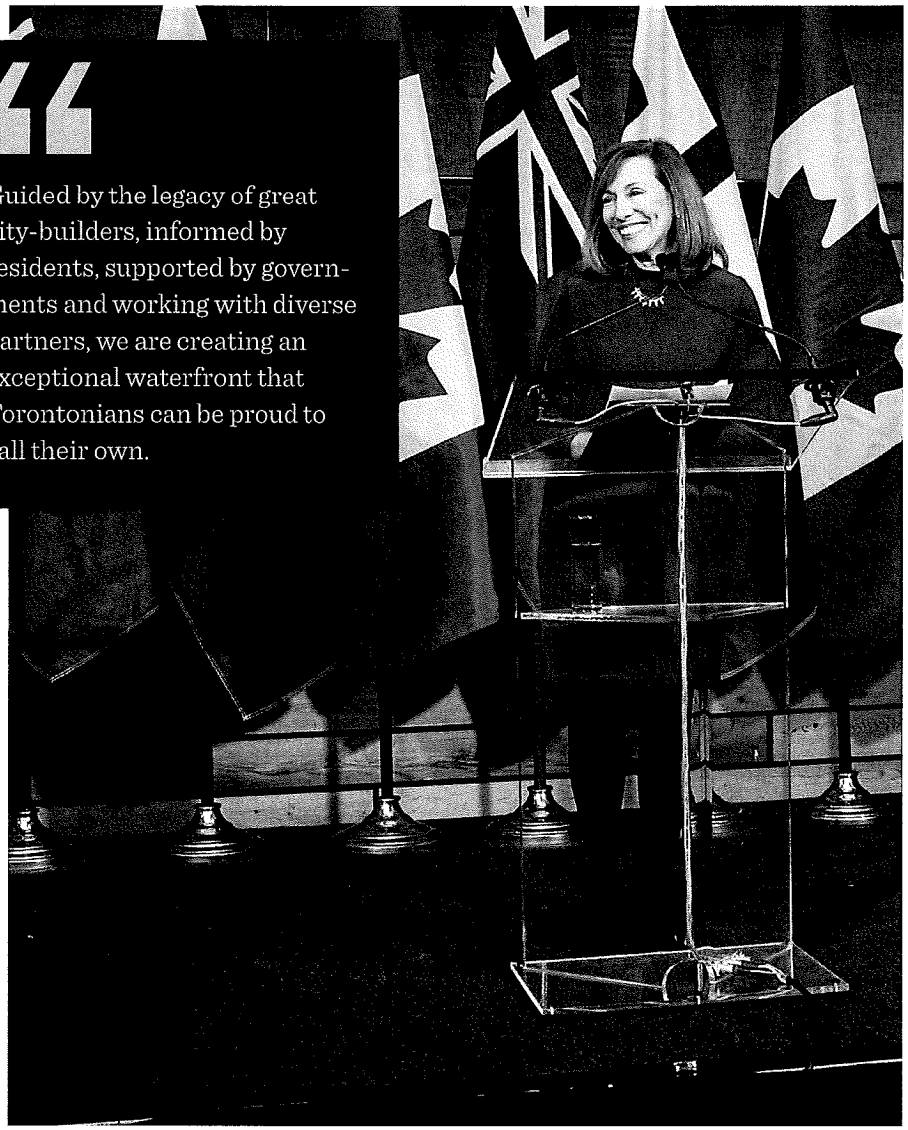
Waterfront Toronto is ready to act as a catalyst, investor, steward, and partner at this critical time. The context has changed since our founding. And the scale of our ambitions has grown. But the same idea remains at the heart of everything we do. We're working alongside Torontonians to make the waterfront—neglected in the 20th century, essential to the 21st—a place where people come together to delight in their city and everything it makes possible.

W.K. Fleissig

**Will Fleissig, President & CEO**



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Helen Burstyn, Chair of Waterfront Toronto's Board of Directors





# A message from Helen

**The vision described in this year's corporate plan is the boldest Waterfront Toronto has ever presented. It's a big vision, but on a human scale—designed to create a connected, walkable, livable waterfront that belongs to every Torontonian.**

Like most great cities, Toronto has its share of iconic buildings and grand monuments that are legacies of its past. But Toronto is also a people city, and much of our unique character comes from visionary city-builders such as Jane Jacobs, whose dedication to people-first planning is woven into the DNA of our modern city and its strong neighbourhoods. No great building or master plan could ever be as powerful a force for urban vitality and innovation as the simple idea that a city grows best when it grows around the needs and priorities of the people who live there.

Waterfront Toronto is working with partners and neighbourhoods to begin a new phase of revitalization along the water's edge. The work we're doing now will boost our mobility and connectivity, spur our growth and resilience, and protect waterways and natural spaces—all while reflecting the values of welcome and inclusion that draw more than 80,000 new people here every year.

Success in realizing the ambitious projects we're launching this year will rest on two pillars. One is the strength of Waterfront Toronto itself, which is actively building its capacity—its staff team, systems and processes, tools and technology—to deliver on its mandate. The other is the strength of Waterfront Toronto's relationships with communities. In the year ahead, the organization will be consulting broadly, engaging neighbours and partners in honest and inclusive conversations about what inspires them and concerns them about their city.

I am fortunate to serve on the Board of Directors of Waterfront Toronto alongside a group of remarkable civic leaders who bring a wealth of experience and a range of perspectives to the governance of this organization. Guided by the legacy of great city-builders, informed by residents, supported by governments and working with diverse partners, we are creating an exceptional waterfront that Torontonians can be proud to call their own.



**Helen Burstyn, Board Chair**



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# Who we are

Waterfront Toronto is working to create a vibrant, connected waterfront that belongs to every Torontonian. As city-builders, we care about creating neighbourhoods, parks, destinations, and infrastructure that make people's lives better.

### Mandate

Our organization was established in 2001 by the Government of Canada, the Province of Ontario, and the City of Toronto to unlock the social and economic potential of the waterfront. Our mandate has been to apply best practices in urban revitalization—from new technology and infrastructure to leading strategies in design and sustainable development—to over 800 hectares of underutilized land along Lake Ontario.

### Record

So far, we've led or catalyzed 2.5 million square feet of development along the waterfront, adding affordable housing, commercial space, aquatic habitat, critical infrastructure, and beloved public spaces. Our projects have included the West Don Lands, Corktown Common, Underpass Park, Sugar Beach, Sherbourne Common, Queen's Quay, the Port Lands, Jack Layton Ferry Terminal, and the Bentway.

### Strategic Initiatives: Leading on urban innovation

Toronto's waterfront isn't just an area with untapped potential for development. It's one of the most exciting city-building opportunities on earth: a place where promising ideas for affordability, liveability, and sustainability can be tested, refined, showcased, and scaled.

This year, Waterfront Toronto will continue to advance strategic initiatives that explore the potential of our waterfront to not only enhance life in Toronto, but to contribute to the urgent global conversation about how to create better cities. We're part of a worldwide community of practice that's using design, technology, and sustainability principles to support dense, vibrant urban communities that are as friendly to people as they are to the planet.

**Sustainability.** We're working with partners like C40 Cities to craft plans to reduce our greenhouse gas emissions to less than zero, and to strengthen our green building requirements.

**Connectivity.** We're working with Beanfield Metroconnect to expand public Wi-Fi across more public spaces and facilities along the waterfront.

**Affordability.** We're looking at a range of financing, partnership, and development models that could create more affordable housing, faster.

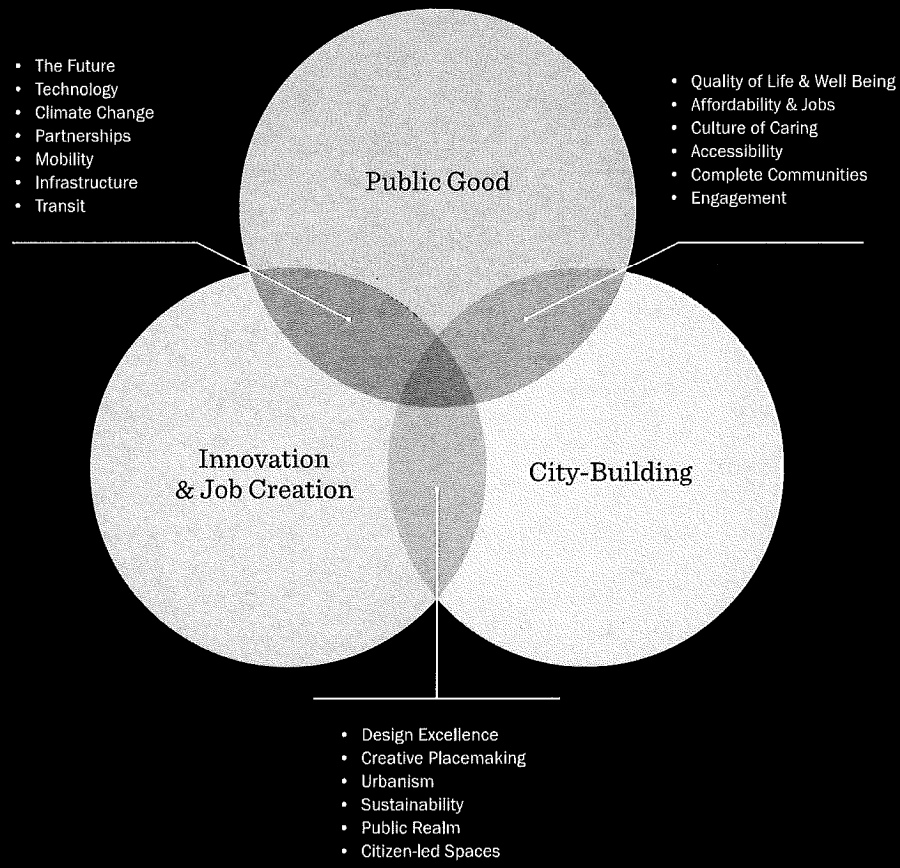
**Innovation.** We're working with partners to create an urban innovation lab on the Quayside site, so the area can serve as an interim hub for city-building collaboration even as Torontonians engage in dialogue about what the area should eventually become.





# Areas of focus

To create a waterfront that supports the outcomes that matter to Torontonians, we're thinking and building at the intersections of innovation, city-building, and the public good.




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# Our board

Waterfront Toronto's Board of Directors is made up of 12 members, including a Chair, jointly appointed by the three orders of government. Our Directors are highly engaged in the Corporation's activities and ensure that our mandate is delivered in an accountable and transparent manner.

**Helen Burstyn**

Chair of the Board of Directors

*Appointed by the Province of Ontario from February 24, 2016 to February 24, 2019*

*Designated as Chair of the Board of Directors on January 1, 2017*

**Mohamed Dhanani**

Executive Officer at His Highness Prince Aga Khan Shia Imami Ismaili Council

*Appointed by the City of Toronto from April 1, 2016 to March 31, 2019*

**Stephen Diamond**

President and CEO, DiamondCorp

*Appointed by the City of Toronto from April 1, 2016 to March 31, 2019*

**Meric Gertler**

President, University of Toronto

Appointed by the Province of Ontario from November 16, 2016 to November 15, 2019

**Susan Henderson**

President, Collins Barrow Toronto Infrastructure Advisory

*Appointed by the City of Toronto from April 1, 2016 to March 31, 2019*

**Julie Di Lorenzo**

President, Diamante Urban Corp

*Appointed by the Province of Ontario from November 4, 2015 to November 4, 2018*

**Ross McGregor**

Former President & CEO,Toronto Region Research Alliance

*Appointed by the Province of Ontario from June 16, 2016 to June 10, 2019*

**Denzil Minnan-Wong**

Deputy Mayor for the City of Toronto City Councilor for Ward 34, Don Valley East

*Appointed by the City of Toronto from December 2, 2014 to November 30, 2018*

**Mazyar Mortazavi**

President & CEO, TAS

*Appointed by the Government of Canada from January 1, 2017 to December 31, 2019*

**Sevaun Palvetzian**

CEO, CivicAction

*Appointed by the Government of Canada from December 1, 2016 to November 30, 2019*

**Janet Rieksts-Alderman**

Managing Director, BRG's Global Capital Projects

*Appointed by the Government of Canada from December 1, 2016 to November 30, 2019*

**Jeanhy Shim**

President and Founder, Housing Lab Toronto

*Appointed by the Government of Canada from June 7, 2017 to June 6, 2020*





From left: Prime Minister Justin Trudeau, Ontario Premier Kathleen Wynne, and Toronto Mayor John Tory listen to Waterfront Toronto CEO, Will Fleissig at the announcement of the Port Lands revitalization project.



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# Management team

## Executive Team

**William Fleissig**
President and CEO

**Meg Davis**
Cheif Development Officer

**David Kusturin**
Chief Project Officer

**Marisa Piattelli**
Chief Strategy Officer

**Lisa Taylor**
Chief Financial Officer

**Chris Glaisek**
Senior Vice President,
Planning and Design

**Leslie Gash**
Vice President, Development

**Julius Gombos**
Vice President, Project Delivery

**Kristina Verner**
Vice President, Innovation,
Sustainability, and Prosperity

**Ian Beverley**
General Counsel

## Senior Staff

**Edward Chalupka**
Director, Government Relations

**Sampada Chandane**
Director, Financial Management

**Erik Cunnington**
Director, Development

**Rose Desrochers**
Director, Human Resources
and Administration

**Meggen Janes**
Director, Soil and Groundwater
Management & Brownfield Approvals

**Simon Karam**
Project Director

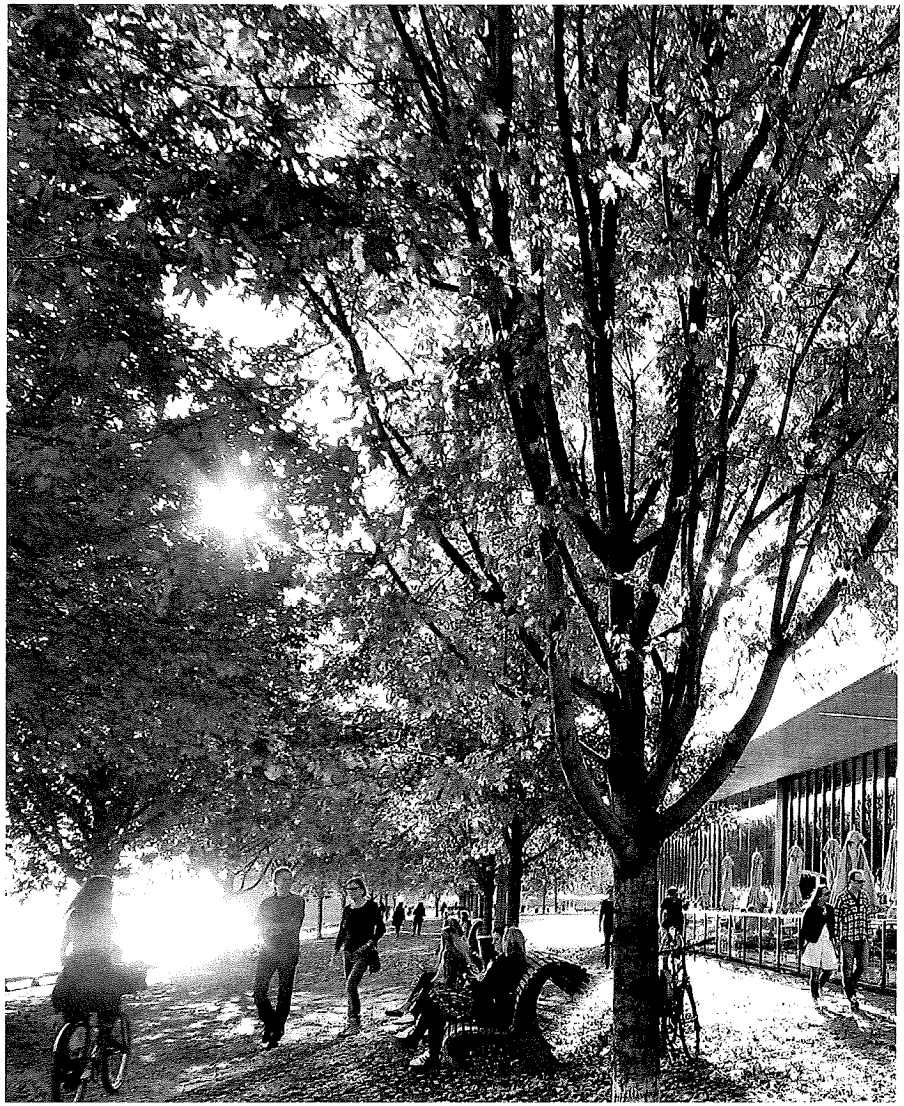
**Pina Mallozzi**
Director, Design

**Kevin Newson**
Director, Procurement

**Amanda Santo**
Director, Development

**Mary Anne Santos**
Director, Financial Planning

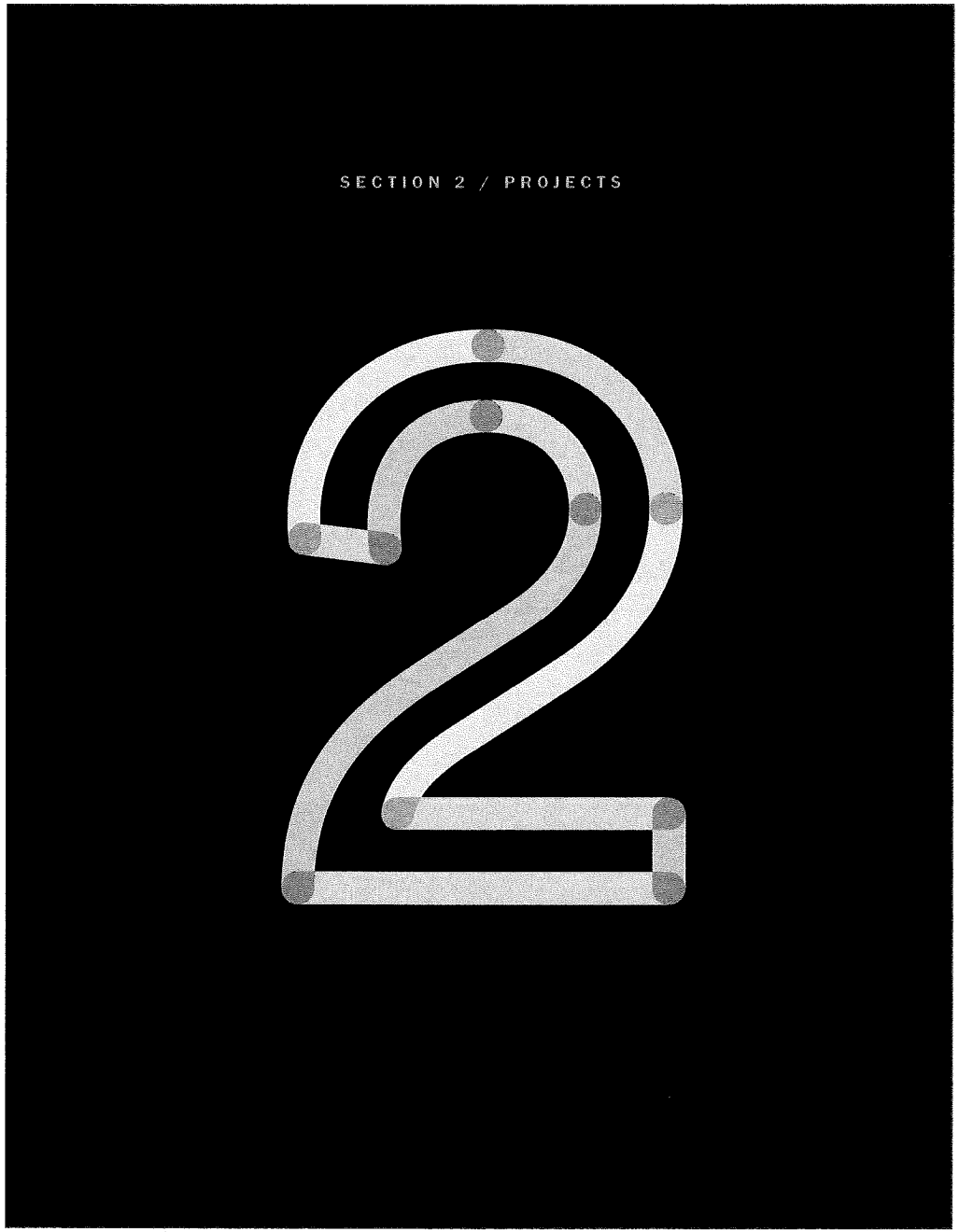




Looking west along the Water's Edge Promenade in East Bayfront.



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# Where innovation meets the public good

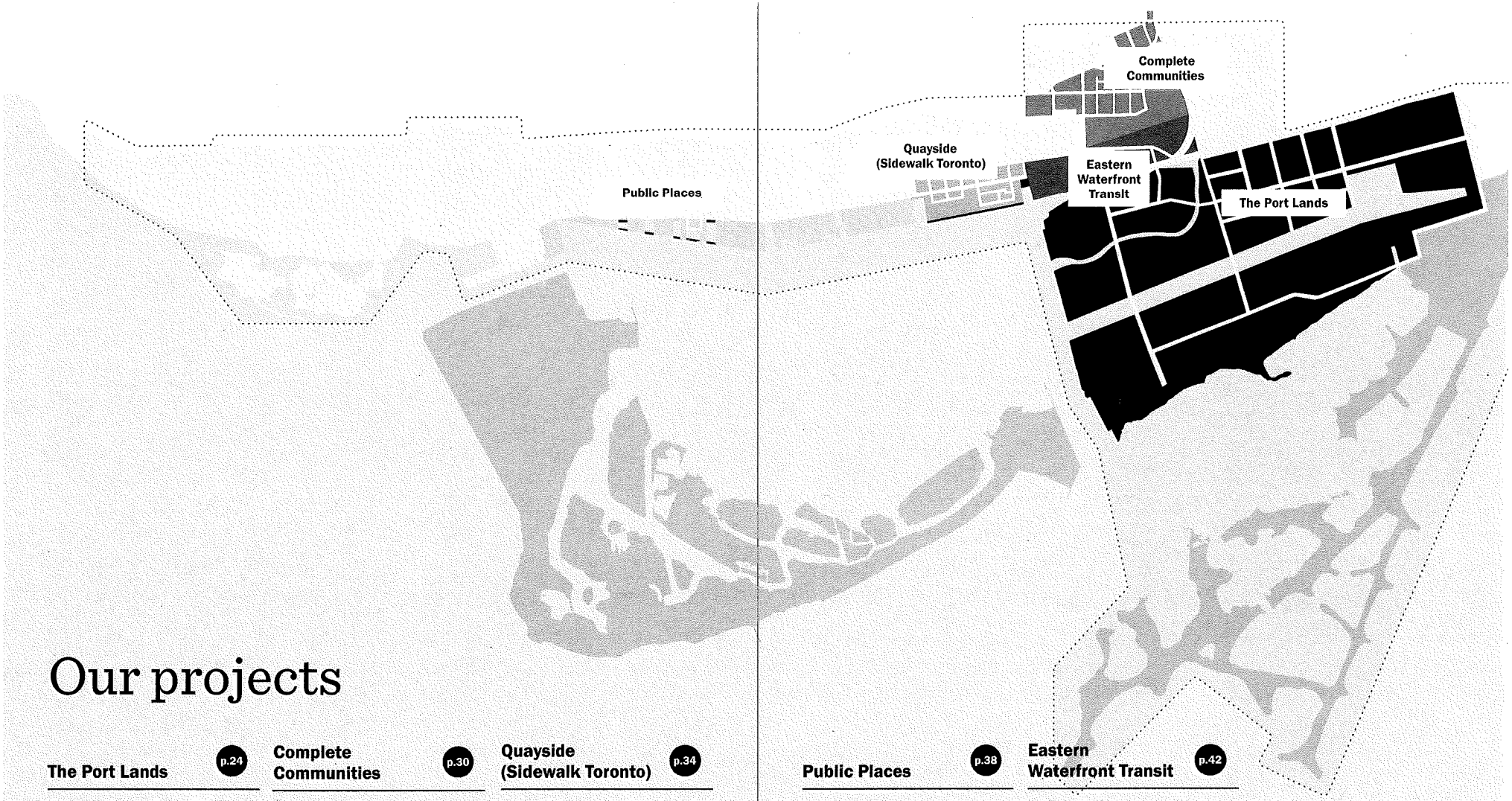
**Over the past 17 years, Waterfront Toronto projects—from Corktown Common to the revitalized Queens Quay to The Bentway—have already begun to change our city for the better, enhancing our quality of life and our economic wellbeing.**

Today, we're embarking on two major initiatives—the Port Lands and Quayside (Sidewalk Toronto)—that hold the potential to transform our city and establish Toronto as a global leader in urban innovation.

This section describes our five key areas of focus in 2018/19, and the concrete steps we're taking toward success in each one.



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# Our projects

**The Port Lands** p.24

An area as big as downtown available for innovative, sustainable development. We're making it usable by undertaking large-scale flood protection work.

**Complete Communities** p.30

We're planning and partnering to ensure that new neighbourhoods along the waterfront are liveable places that work for people and enhance the city.

**Quayside (Sidewalk Toronto)** p.34

An innovative neighbourhood where Toronto has an opportunity to set new precedents in affordability, sustainability, mobility, and prosperity.

**Public Places** p.38

We've already helped to create more than 90 acres of new parks and public spaces by the lake. This year, there will be even more great places to gather.

**Eastern Waterfront Transit** p.42

Better waterfront transit service is coming. Momentum is gathering for improved mobility along the lakeshore—from Woodbine Avenue to Etobicoke.





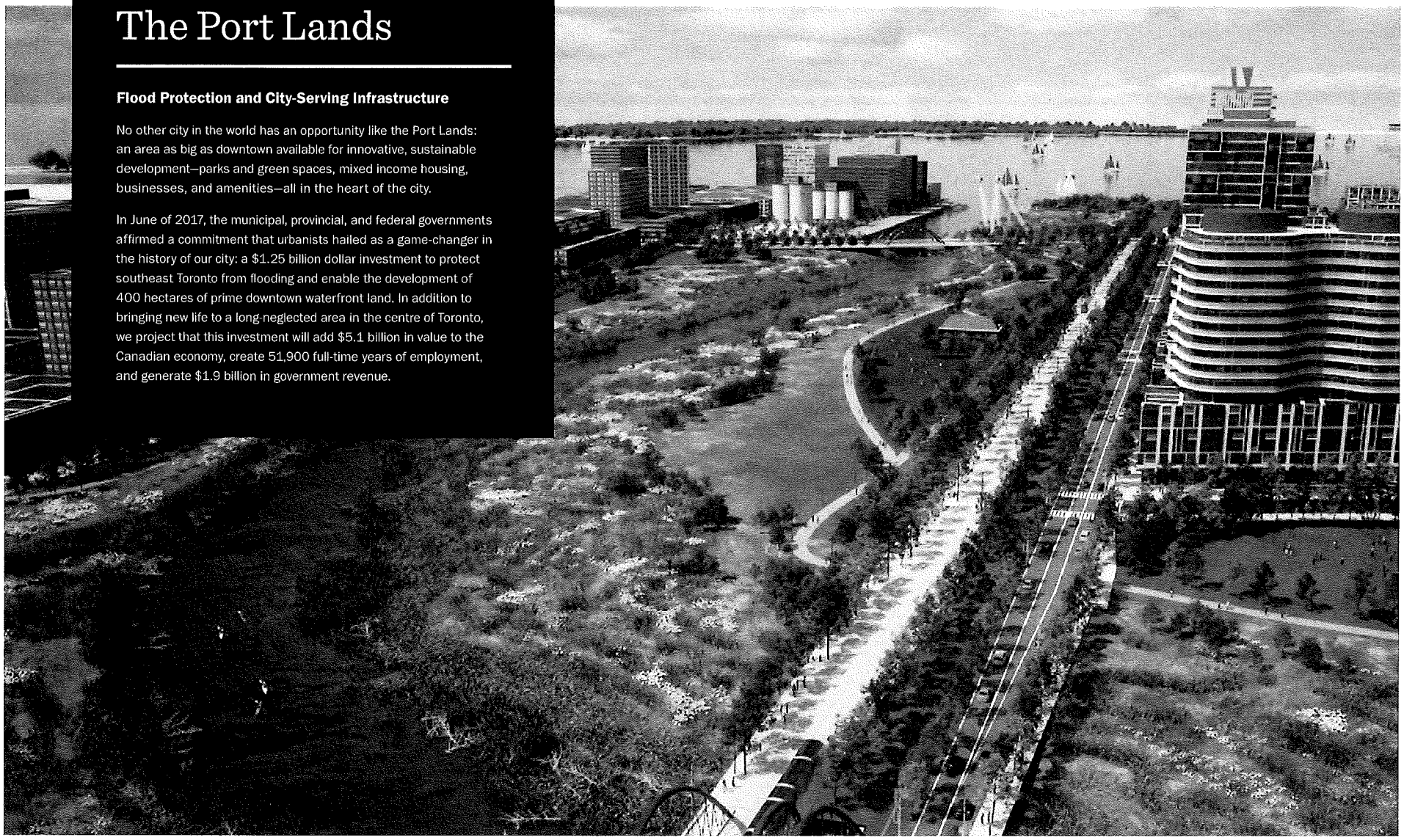
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# The Port Lands

## Flood Protection and City-Serving Infrastructure

No other city in the world has an opportunity like the Port Lands: an area as big as downtown available for innovative, sustainable development—parks and green spaces, mixed income housing, businesses, and amenities—all in the heart of the city.

In June of 2017, the municipal, provincial, and federal governments affirmed a commitment that urbanists hailed as a game-changer in the history of our city: a $1.25 billion dollar investment to protect southeast Toronto from flooding and enable the development of 400 hectares of prime downtown waterfront land. In addition to bringing new life to a long-neglected area in the centre of Toronto, we project that this investment will add $5.1 billion in value to the Canadian economy, create 51,900 full-time years of employment, and generate $1.9 billion in government revenue.

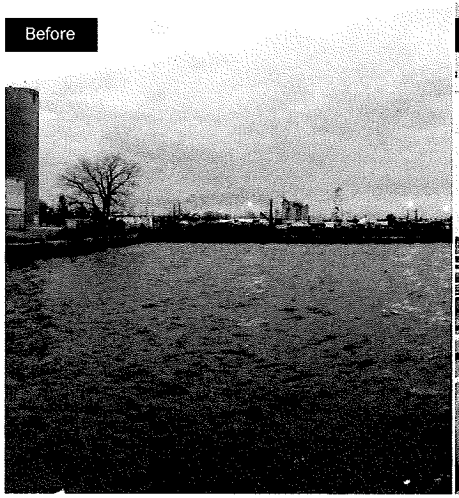


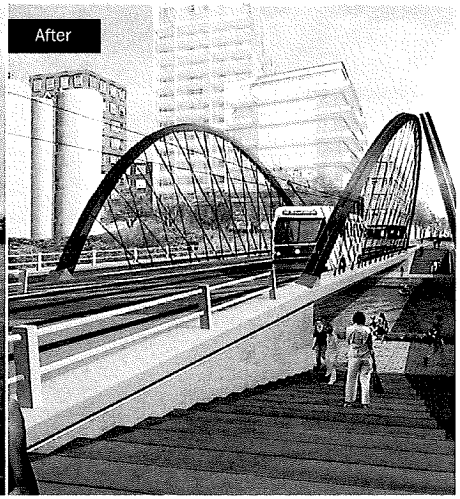
Looking west along the new river valley to the new Cherry Street Bridge and renaturalized mouth of the Don.





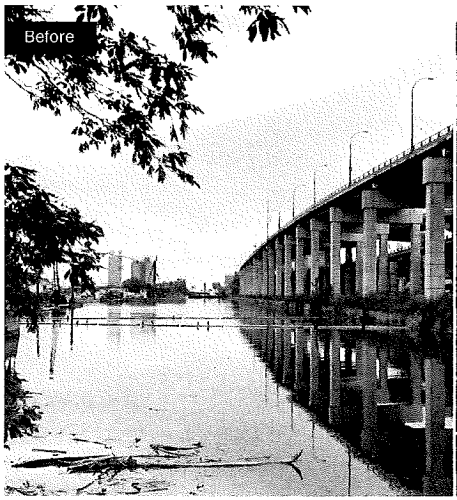
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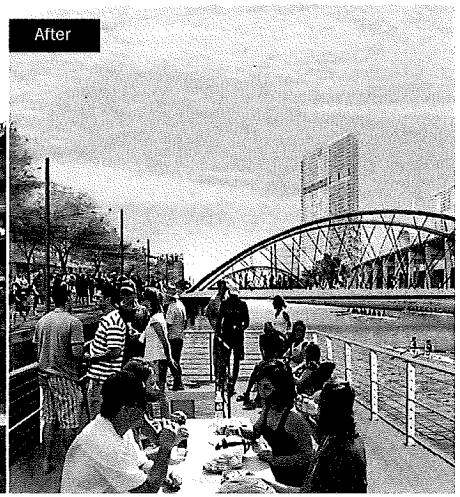



## Cherry Street

Looking southeast at North Cherry Street Bridge and realigned/new transportation

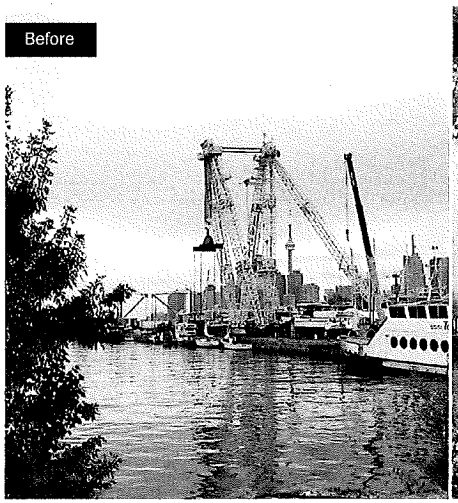


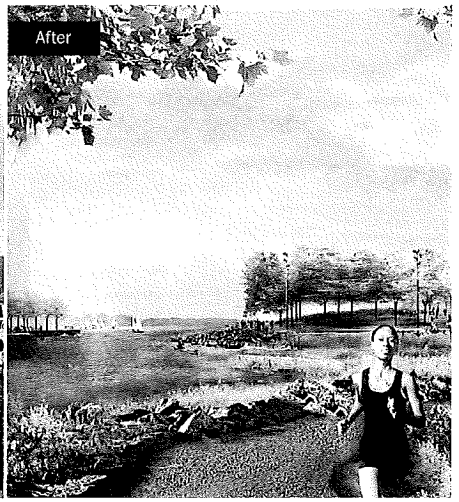




## Keating Channel

Looking west at vibrant public space along Keating Channel

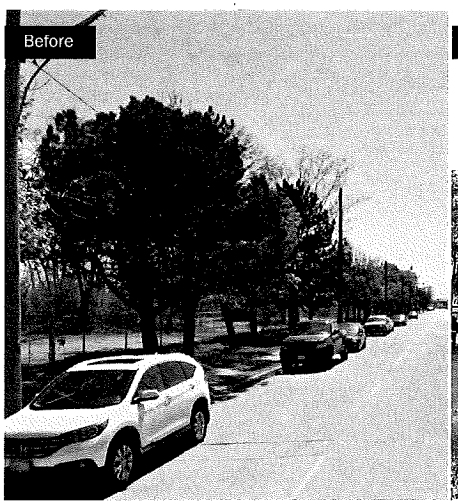


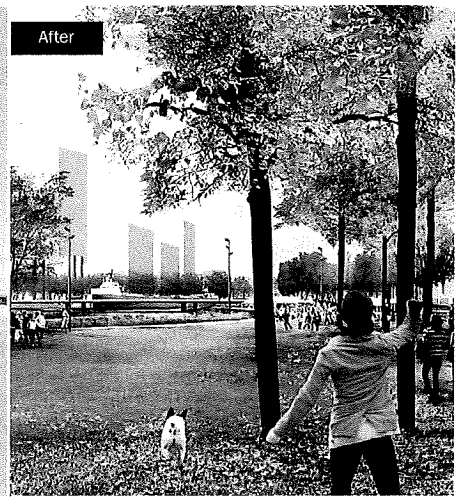



## Don River

Looking west across the naturalized mouth of the Don River




## Commissioners Street

Looking west across new neighbourhood parks along Commissioners Street



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# The Port Lands

**Progress**

## Funding:

| | |
|---|---|
| **Flood Protection and City-Serving Infrastructure** | **210.0m** |
| **Cherry Street Stormwater and Lakefilling Infrastructure** | **38.8m** |

## Total investment this year:

# $248.8m

## Key partners:

- **Government of Canada**
- **Government of Ontario**
- **City of Toronto**
- **Toronto and Region Conservation**
- **Infrastructure consulting from Rijkswaterstaat, the Dutch Ministry of Infrastructure**





## 2018/19:

**This year, we're...**

- Continuing the detailed designs for planned flood protection measures, such as the river valley and parks, as well as roads and bridges.
- Carrying out important preliminary steps, including a comprehensive risk assessment and timely engagement with people and businesses who might be affected by our construction works.
- Beginning excavation of the river valley—the first step toward creating a new pathway for water to flow in a safe, contained way from the river into Lake Ontario.

## History:

**The story so far**

In the early 1900s, Toronto filled in the wetland now known as the Port Lands to make space for growing industry—and redirected the Don River with an unnatural hard turn. Today, the area holds enormous potential to enhance the life and prosperity of our city. To realize that potential, we need to rehabilitate the health of the soil and protect the area from flooding by restoring and enhancing the natural flood protection capacity that once existed at the mouth of the Don.

"This flood protection landform radically alters the river's environmental health, as well as the linear industrial geography of the Port Lands and therefore the destiny of the city. It is a project for the ages that will deservedly draw the attention of the world's great cities."

*John Lorinc, Spacing Magazine, June 29, 2017*



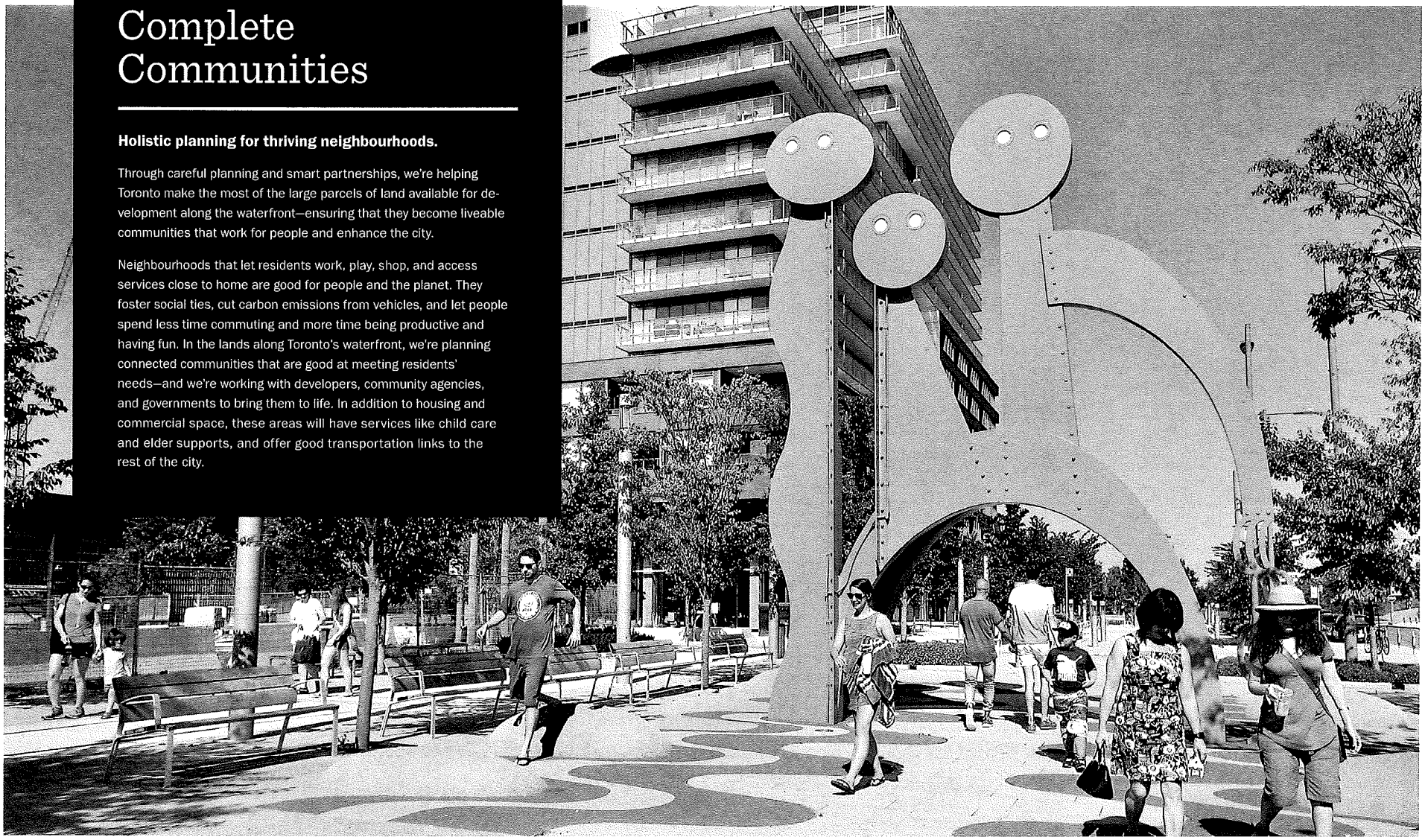
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# Complete Communities

**Holistic planning for thriving neighbourhoods.**

Through careful planning and smart partnerships, we're helping Toronto make the most of the large parcels of land available for development along the waterfront—ensuring that they become liveable communities that work for people and enhance the city.

Neighbourhoods that let residents work, play, shop, and access services close to home are good for people and the planet. They foster social ties, cut carbon emissions from vehicles, and let people spend less time commuting and more time being productive and having fun. In the lands along Toronto's waterfront, we're planning connected communities that are good at meeting residents' needs—and we're working with developers, community agencies, and governments to bring them to life. In addition to housing and commercial space, these areas will have services like child care and elder supports, and offer good transportation links to the rest of the city.



*The Water Guardians* by Jennifer Marman and Danial Borins create a playful environment on the Front Street Promenade in the West Don Lands.





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# Complete Communities

**Progress**

## Funding:

| | |
|---|---|
| **Stormwater System** | **19.9m** |
| **Parliament and Queens Quay East Intersection** | **16.1m** |
| **Bayside** | **10.9m** |
| **Queens Quay—Bay to Spadina** | **2.6m** |
| **Other projects; including dockwall reinforcement, construction of streets, and related planning approvals** | **1.9m** |
| **West Don Lands** | **1.5m** |
| **Dockside** | **1.3m** |
| **Environmental assessment for flood protection at Broadview and Eastern** | **0.8m** |

## Total investment this year:

# $55.0m





## 2018/19:

**This year, we're...**

- Adding parks and green space to the new East Bayfront neighbourhood around the foot of Sherbourne Street Residents began moving into the area's developments last year.
- Completing work on a stormwater system to serve East Bayfront and the surrounding area: we're installing treatment equipment, electrical systems, pipes, and mains. This work will keep stormwater runoff, which often contains oil and silt, from reaching the lake.
- Finalizing precinct plans (designs for complete communities) for a number of areas, including Villiers Island.
- Obtaining municipal approvals, completing environmental assessments, seeking building permits, and working with developers—in short, taking all the governmental and regulatory steps required to bring complex developments to life.
- Doing road work to better link the Port Lands, including Quayside, to the city. Currently, Queens Quay veers away from the water at Parliament Street. We're working to straighten this intersection, extending Queens Quay eastward to the Port Lands and drawing Parliament toward the water. Specific activities for 2018/19 include environmental and geotechnical investigations, and any necessary land acquisitions.

## History:

**The story so far**

Unlike much of Toronto, the waterfront still has large parcels of land available for revitalization. These areas have been underutilized, often due to contamination from past industrial use. It's rare for a big city like Toronto to have opportunities to develop large areas so close to downtown—as opposed to building infill. Making the best possible use of these waterfront parcels is vital to our city's future.



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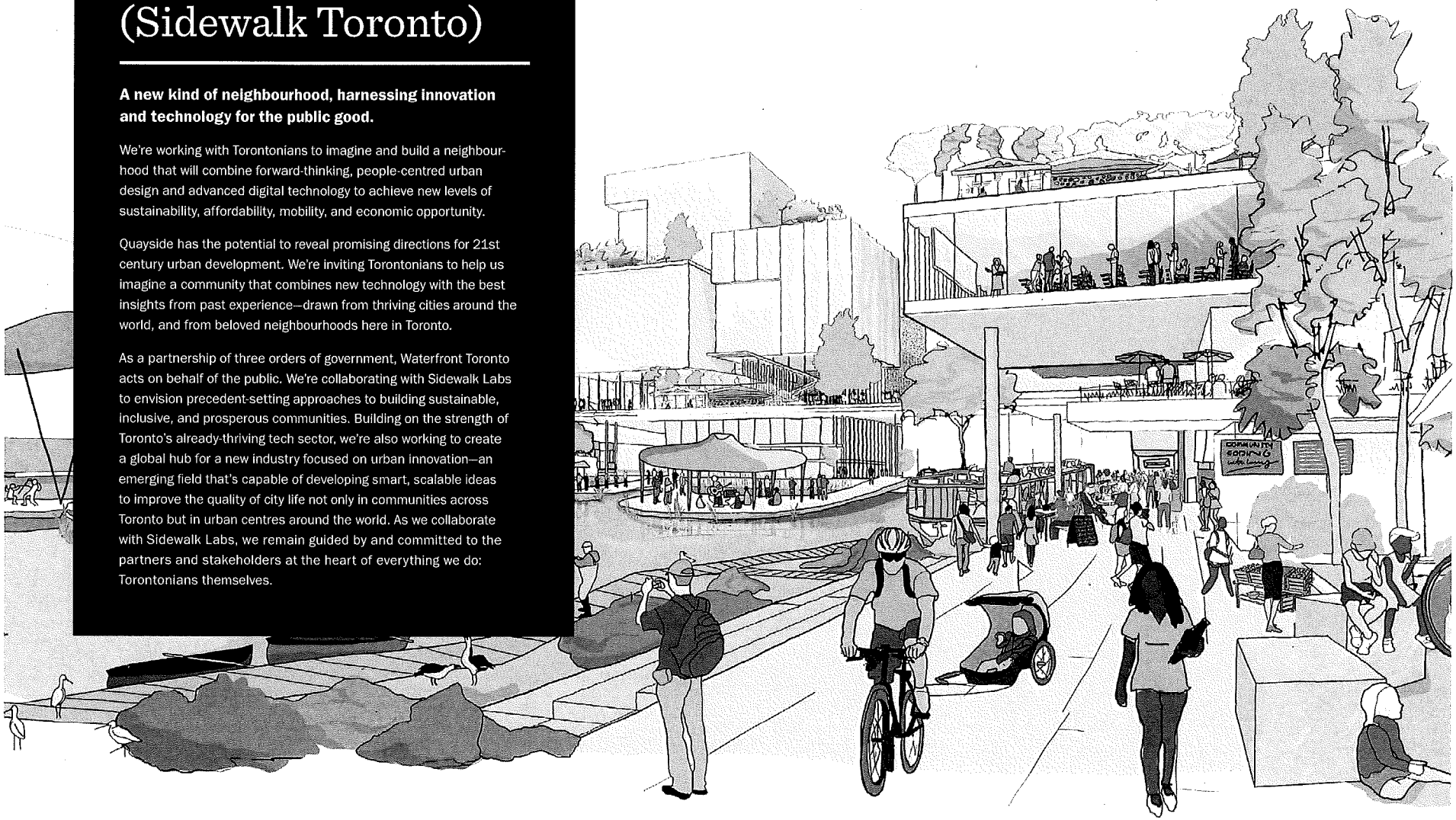
# Quayside (Sidewalk Toronto)

**A new kind of neighbourhood, harnessing innovation and technology for the public good.**

We're working with Torontonians to imagine and build a neighbourhood that will combine forward-thinking, people-centred urban design and advanced digital technology to achieve new levels of sustainability, affordability, mobility, and economic opportunity.

Quayside has the potential to reveal promising directions for 21st century urban development. We're inviting Torontonians to help us imagine a community that combines new technology with the best insights from past experience—drawn from thriving cities around the world, and from beloved neighbourhoods here in Toronto.

As a partnership of three orders of government, Waterfront Toronto acts on behalf of the public. We're collaborating with Sidewalk Labs to envision precedent-setting approaches to building sustainable, inclusive, and prosperous communities. Building on the strength of Toronto's already-thriving tech sector, we're also working to create a global hub for a new industry focused on urban innovation—an emerging field that's capable of developing smart, scalable ideas to improve the quality of city life not only in communities across Toronto but in urban centres around the world. As we collaborate with Sidewalk Labs, we remain guided by and committed to the partners and stakeholders at the heart of everything we do: Torontonians themselves.



An artist's rendering included in Sidewalk Labs' vision response to our Quayside Innovation and Funding Partner Request for Proposals.





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# Quayside (Sidewalk Toronto)

## Total investment this year:

# = $3.6m

## Resources:

**Vital first steps**

Complementing Waterfront Toronto's investments in Quayside this year, our innovation and funding partner Sidewalk Labs has committed to fund up to $50 million (USD) for an initial phase of public engagement, joint planning, and pilot project testing.

The scale of this support indicates the strength of Sidewalk Labs' commitment to an inclusive visioning process for Quayside. It's also one more case of Waterfront Toronto enhancing the impact of public investments by combining them with private-sector resources to realize the full potential of the extraordinary development opportunities along Toronto's lakeshore.

## Key partner: Sidewalk Labs





## 2018/19:

**This year, we're...**

- Undertaking intensive community and stakeholder engagement and consultation about the future of Quayside. In addition to meeting with residents at town halls, pop-ups and other events, we're having conversations with the City, the TTC, utilities and other important stakeholders. So far, what we're hearing is that affordability, data privacy, and meaningful public input on planning are top concerns; in the months ahead, the consultation agenda will continue to take shape in live gatherings and online.
- Considering, in partnership with Sidewalk Labs, a range of sustainability options related to construction, engineering and operations on the Quayside site, and how some of these innovations may apply to the broader eastern waterfront.

## History:

**The story so far**

Quayside is a specific parcel of land largely owned by Waterfront Toronto and the City of Toronto, and located in a historically underutilized area near the foot of Parliament Street. Quayside has also become shorthand for a developing vision for the area, and an associated implementation plan. Last year, Waterfront Toronto called for innovative ideas about how to plan, fund, and build a new kind of complete community by the lake. We invited proposals that would support mobility, inclusion, affordability, prosperity, sustainability, liveability, and great design. Sidewalk Labs made the most compelling proposal, and we've agreed to start exploring the future of Quayside in greater detail together—in consultation with Torontonians.

"Sidewalk Toronto will transform Quayside into a thriving hub for innovation and a community for thousands of people to live, work, and play."

*Prime Minister Justin Trudeau*



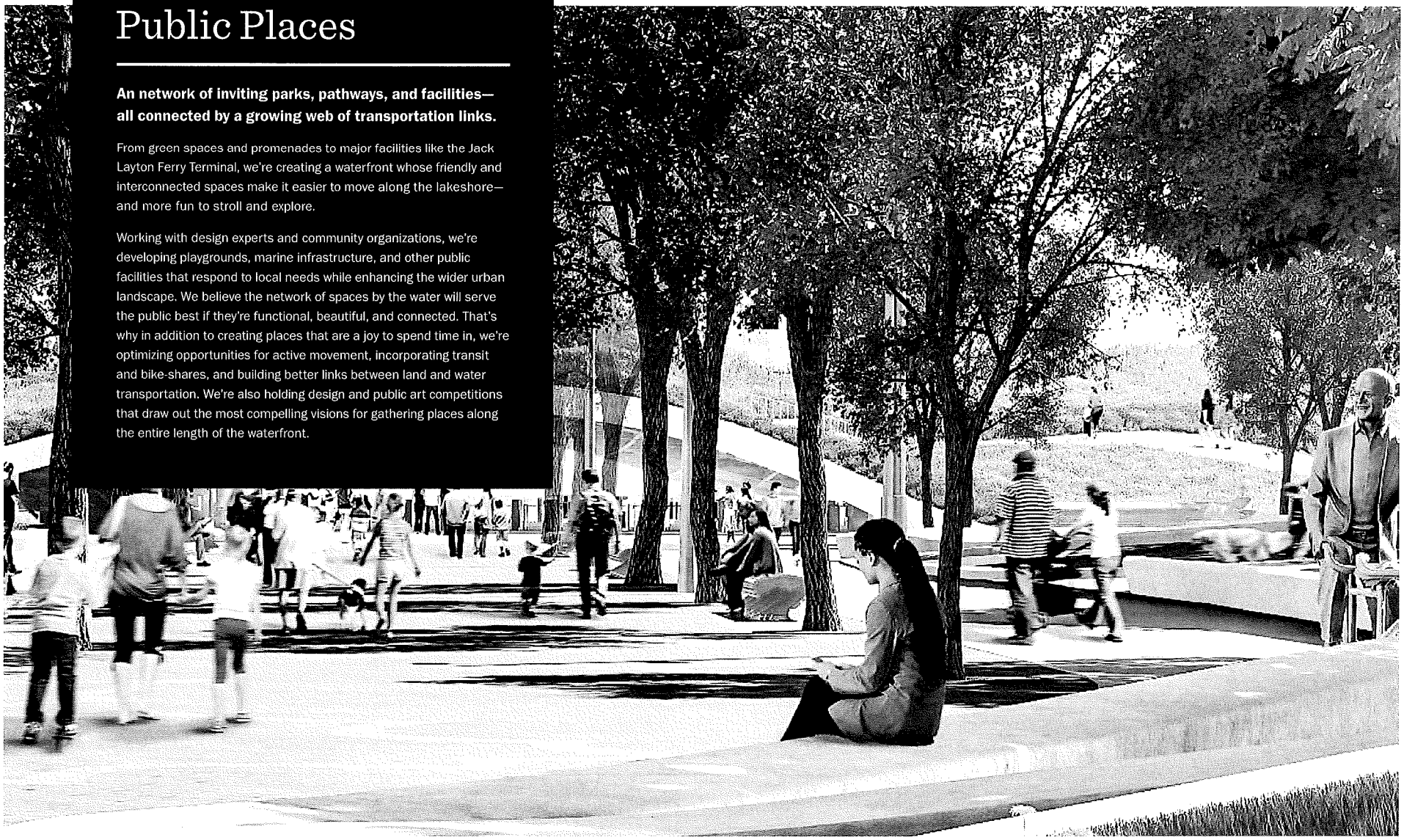
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# Public Places

**An network of inviting parks, pathways, and facilities—all connected by a growing web of transportation links.**

From green spaces and promenades to major facilities like the Jack Layton Ferry Terminal, we're creating a waterfront whose friendly and interconnected spaces make it easier to move along the lakeshore—and more fun to stroll and explore.

Working with design experts and community organizations, we're developing playgrounds, marine infrastructure, and other public facilities that respond to local needs while enhancing the wider urban landscape. We believe the network of spaces by the water will serve the public best if they're functional, beautiful, and connected. That's why in addition to creating places that are a joy to spend time in, we're optimizing opportunities for active movement, incorporating transit and bike-shares, and building better links between land and water transportation. We're also holding design and public art competitions that draw out the most compelling visions for gathering places along the entire length of the waterfront.



Looking south to the pedestrian bridge by the new Jack Layton Ferry Terminal





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# Public Places

**Progress**

## Funding:

| | |
|---|---|
| **Public Art** | **3.5m** |
| **The Bentway** | **2.2m** |
| **Jack Layton Ferry Terminal** | **1.0m** |
| **Parks (York Street, Rees Street)** | **0.9m** |
| **Other** | **0.2m** |

## Total investment this year:

# $7.8m





## 2018/19:

**This year, we're...**

- Completing construction on the first phase of the Jack Layton Ferry Terminal—the gateway to the Toronto Islands, one of the city's best used and best loved natural spaces.
- Getting The Bentway ready for public use—installing lighting, improving landscaping along the path, and adding amenities like the new skating trail. This long-neglected space will come alive in 2018.
- Soliciting creative visions from planners, designers, and artists for new waterfront destinations, including two new parks and a public art piece.
- Receiving City approval of the Villiers Island Public Art Strategy (to be appended to the Precinct Plan) and beginning to implement the Villiers Island Public Art Plan.

## History:

**The story so far**

Since 2001, we've helped to transform 90 acres of waterfront land from empty, underutilized space into vibrant public gathering places—like Sherbourne Common, Underpass Park, Corktown Common, and the revitalized Queens Quay—that attract and connect Torontonians.

"Waterfront Toronto's parks are incredible. Corktown Common is Toronto's best new public space."

*Norman Di Pasquale, Steering Committee Member, Waterfront for All*



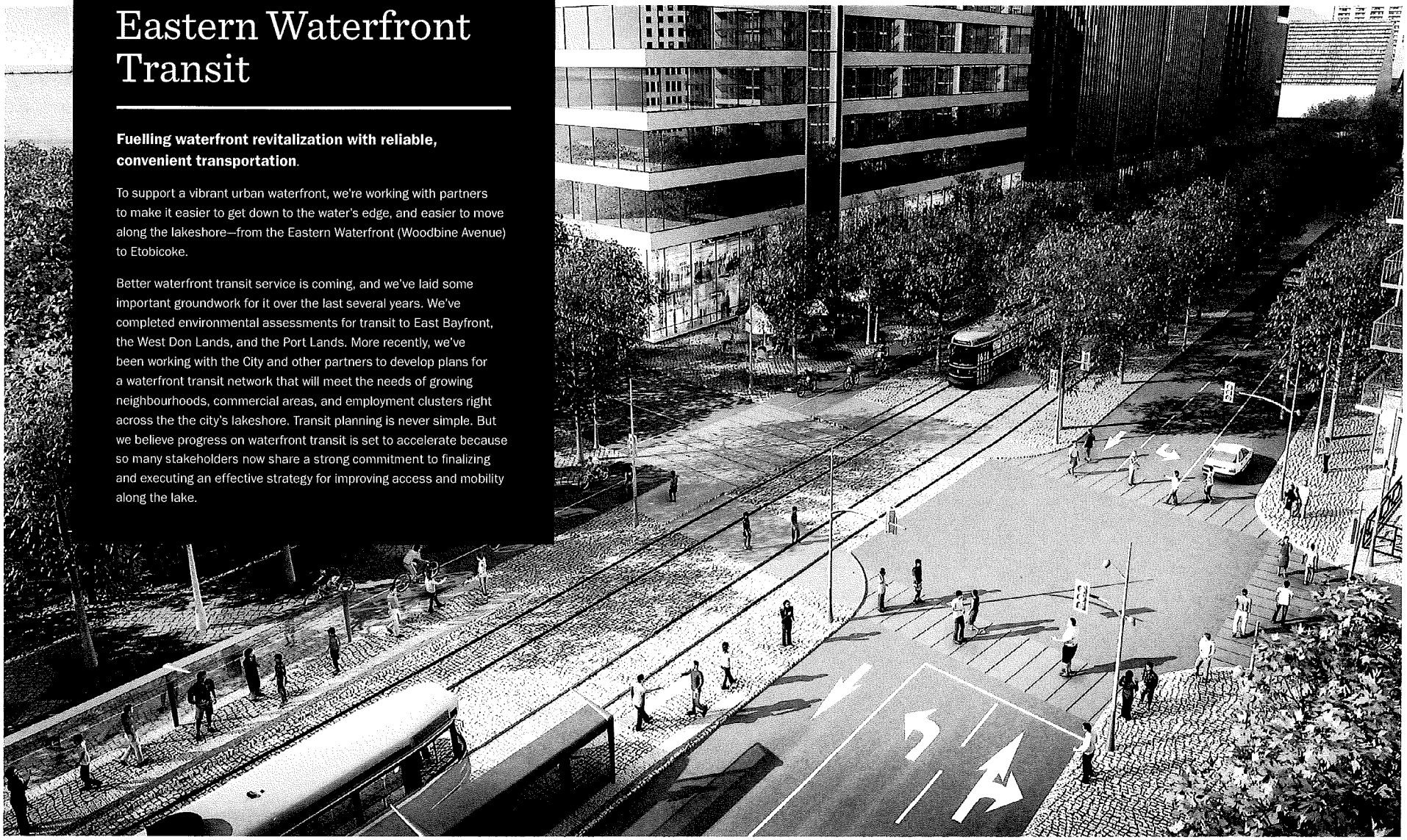
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# Eastern Waterfront Transit

**Fuelling waterfront revitalization with reliable, convenient transportation.**

To support a vibrant urban waterfront, we're working with partners to make it easier to get down to the water's edge, and easier to move along the lakeshore—from the Eastern Waterfront (Woodbine Avenue) to Etobicoke.

Better waterfront transit service is coming, and we've laid some important groundwork for it over the last several years. We've completed environmental assessments for transit to East Bayfront, the West Don Lands, and the Port Lands. More recently, we've been working with the City and other partners to develop plans for a waterfront transit network that will meet the needs of growing neighbourhoods, commercial areas, and employment clusters right across the the city's lakeshore. Transit planning is never simple. But we believe progress on waterfront transit is set to accelerate because so many stakeholders now share a strong commitment to finalizing and executing an effective strategy for improving access and mobility along the lake.



Artists' rendering of completed Queens Quay East revitalization in East Bayfront.





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# Eastern Waterfront Transit

## Total investment this year:

# $0.3m

## 2018/19:

**This year, we're...**

Focused on creating a good transit link between Union Station and the waterfront. Over the medium term, we're planning to deliver much enhanced service between Union Station and multiple waterfront destinations. However, since assembling the necessary funding and constructing the infrastructure will take several years, for now we're working on a near-term option that will enhance the service and convenience of the Bay Street bus. This year we're also undertaking some due diligence work aimed at assessing and selecting the best longer-term solutions.

## History:

**The story so far**

For many years, transit planning along the waterfront was fragmented and incremental. A couple of years ago, leaders agreed that it was time to think more comprehensively about mobility near the lake. In 2016, City staff and others took stock of all the existing plans and studies, seeking to identify and combine the best ideas. In 2017, we were part of a collaboration that developed an integrated, waterfront-wide transit strategy; it proposes a network that will run along the lake from Woodbine Avenue to Etobicoke, and serve new waterfront neighbourhoods in the centre of the city. The strategy will be presented to Toronto City Council for approval early in 2018.



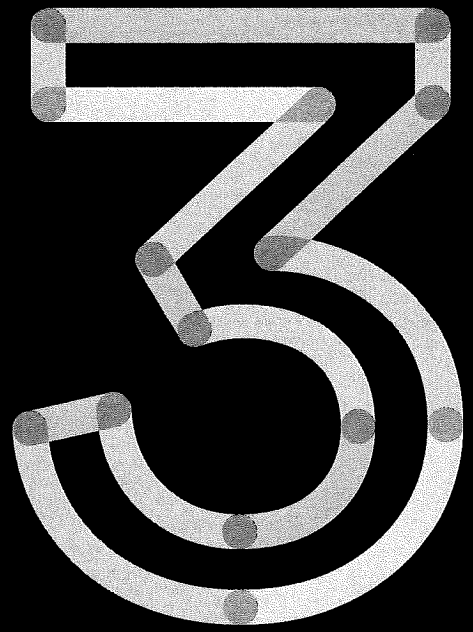



The 514 Cherry route opened in 2016, the first new streetcar line introduced in 16 years. It was completed as part of the West Don Lands plan.



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SECTION 3 / FINANCIALS





# Where vision meets action

**The people of Toronto, Ontario and Canada are making big investments in the ambitious waterfront renewal projects described in this plan.**

Waterfront Toronto is committed not only to the careful and transparent management of public funds, but to designing the team, processes, and systems that will let us generate the greatest possible public benefit with the resources entrusted to us.

This section lays out how our capital investments are being deployed this year, and how we're adapting our organization to deliver outstanding results as we get two exceptionally ambitious initiatives—Quayside (Sidewalk Toronto) and the Port Lands—underway.



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# Capital investment plan

*Figures are in $ millions*

| Corporate Plan Page # | Priority Initiatives | 2018/2019 Planned Investment | Estimated Investment to March 31, 2018 | Balance of Capital Investment | Total Capital Investment 2003/4 through 2023/24 |
|---|---|---|---|---|---|
| 24 | **The Port Lands** (a) | $ 248.8 | $ 66.2 | $ 935.0 | $ 1,250.0 |
| 30 | **Complete Communities** | 55.0 | 488.6 | 129.5 | 673.1 |
| 34 | **Quayside (Sidewalk Toronto)** | 3.6 | 1.9 | 8.1 | 13.6 |
| 38 | **Public Places** | 7.8 | 69.8 | 32.2 | 109.8 |
| 42 | **Eastern Waterfront Transit** | 0.3 | 17.7 | - | 18.0 |
| 14 | **Strategic Initiatives** | 0.7 | 8.1 | 26.9 | 35.7 |
| 55 | **Core Support Functions** (b) | 8.2 | 55.2 | 19.1 | 82.5 |
| **Waterfront Toronto Total** | | **$ 324.4** | **$ 707.5** | **$ 1,150.8** | **$ 2,182.7** |

(a) The Port Lands is an area of particular focus this year, as we begin to allocate a combined public investment of $1.25 billion that will roll out through 2028. The $249 million directed to the Port Lands in 2018/19 represents 77% of our total capital investment for the year. Learn more about this major project on pages 24 through 27.

(b) As we mobilize to deliver on our five key priorities this year, we're investing in the team and processes that will support our success. See discussion on pages 47, 52-3, and 55





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# Corporate operating budget

| | 2017/18 Revised Budget | 2018/19 Budget | Change from 2017/18 Revised Budget | | % Change from 2017/18 Revised Budget |
|---|---|---|---|---|---|
| General and Office Administration | $ 1.3 | $ 1.4 | $ 0.1 | a | 7.7% |
| Accountability, Governance, and Performance Measurement Initiatives | 0.1 | 0.4 | 0.3 | b | 300% |
| Information Technology (IT) | 0.5 | 0.5 | - | | - |
| Public Engagement and Communication | 0.6 | 0.6 | - | | - |
| Human Resources (HR) | 11.2 | 15.2 | 4.0 | c | 35.7% |
| Operating Budget Before Amortization | $ 13.7 | $ 18.1 | $ 4.4 | | 32.1% |
| Amortization | 0.2 | 0.5 | 0.3 | | |
| Operating Budget After Amortization | $ 13.9 | $ 18.6 | $ 4.7 | | 33.8% |

*Figures are in $ millions*





## Waterfront Toronto's 2018/19 operating budget is $4.7 million (or 34%) higher than last year. The following changes explain the difference.

**a**

The expansion of our office space at 20 Bay Street (see discussion under Capital Budget on page 50) will increase our operating costs in 2018/19.

**b**

As we begin to advance projects that are unprecedented in their scale and ambition, we're engaging experts to help us ensure that our performance measurement and resiliency and risk management approaches are optimized to support our success. This $0.3M increase over last year will go toward:

- The development and implementation of a formal, outcome-based performance measurement and reporting framework. The framework will define and prioritize our key performance indicators (KPIs), set performance targets, and allow us to more systematically measure our progress against strategic and operational objectives. We'll also adapt our employee performance management system to ensure that our team's efforts are carefully aligned with Waterfront Toronto's KPIs.
- A new enterprise content management strategy. We're developing a clear framework for the retention and digitization of documents and content. Implementing this strategy will free up office space as well as digital storage, both important to our organization's resiliency as we grow. A rationalized approach to content management and storage will also enhance our ability to share information efficiently, both with colleagues and with external stakeholders.
- A detailed five-year business plan (2019/20 to 2023/24). Required by Waterfront Toronto's enabling legislation, this plan will be presented for the review and approval of our Board of Directors in December 2018.

**c**

We scaled back our team last year while we awaited greater certainty about when and how our two largest projects—the Port Lands and Quayside—would proceed. With both these major initiatives now moving forward, we've added essential project staff in areas such as project delivery, procurement, accountability, and public engagement. This has expanded our total staff team from 79.5 positions to 99, and increased our HR spending by $4.0 million.



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# Corporate capital budget

| | 2017/18 Revised Budget | 2018/19 Budget | Change from 2017/18 Revised Budget | % Change from 2017/18 Revised Budget |
|---|---|---|---|---|
| Technology Infrastructure | 1.3 | 0.2 | (1.1) | (84.6%) |
| Facility Improvements | 0.8 | 0.2 | (0.6) | (75.0%) |
| Total Corporate Capital Budget | 2.1 | 0.4 | (1.7) | (81.0%) |

*Figures are in $ millions*

## Notes on this year's investments

Last year (2017/18), we made significant investments in technology, infrastructure, and facilities as part of our new Organizational Resiliency Plan. For instance, we expanded our office space, implemented a new Enterprise Resource Planning (ERP) system, and made other technology-related improvements.

This year, we're on course to begin realizing the benefits of those investments. Also, since those significant expenditures are behind us, this year's corporate capital investment of $0.4 million (2018/19) is considerably lower than last year's figure ($2.1 million).

Outside of regular, recurring expenses, we're making two notable expenditures this year:

1. Replacing an outdated document management and storage system (Sharepoint 2010) with a web-based version that's compatible with our other tools, including our new cloud-based Enterprise Resource Planning system.

2. Reconfiguring our existing office space at 20 Bay Street. Last year, we expanded our overall footprint from 15,000 square feet to 16,600. This year, we're reconfiguring the space to accommodate 13 new work stations—required as we grow to include 99 staff (see discussion on pages 51 and 53)—and to make more room for meetings and collaboration. Also, by co-locating our team members working on Quayside with our partners at Sidewalk Labs, we've been able to keep our office expansion at 20 Bay Street relatively modest.





## Staff increases concentrated in key project areas

This year, our team will expand to 99 people, with 19.5 new positions proposed as part of our human resources budget in order to drive our progress in 2018/19.

As compared to the 2017/18 Corporate Plan amendment, we're adding only one position at the executive level. Most of our new hires are at the director and manager levels.

About half of our new team members are focused primarily on our transformational projects. To drive the Port Lands flood protection project forward, we'll engage 4.5 project managers and a project coordinator. To support Quayside (Sidewalk Toronto) during the year ahead, we'll engage an infrastructure/finance advisor, a planner, two communications specialists, and 2.5 managers. Together, staff dedicated to these two projects represent 12 of our 19.5 new hires. The others will be engaged in Core Support functions, including operations, human resources, procurement, and project management.

Because our work focuses on complex, multi-year capital projects, we need the skills and expertise to achieve great results as well as the flexibility to scale up and scale back as the demands of our projects evolve. To this end, we make use of both permanent and contract staff; of the 19.5 positions we've added since the last corporate plan, 10 have been contract positions.

We plan carefully to keep our staff team closely aligned to the needs of our major capital projects. As well, Waterfront Toronto does planning work and engages with private developers to ensure that waterfront revitalization proceeds in a rational and coherent way that benefits the public. So although our team's growth generally tracks with the scale of our capital projects—as evidenced by this year's new hires—our staff do a lot of work related to planning, partnerships, and community consultation that enhance the waterfront and serve the public but aren't directly tied to our own capital initiatives.

## Core support functions

As we mobilize to deliver our five key projects (p. 20-45), we're investing in the systems and processes that will support our success. Some of these—like our new governance and risk framework (p. 56-57), our performance measurement framework (p. 51), and our enterprise content management system (p. 51)—are covered elsewhere in this section.

In addition to investments in those areas, we're also building out the technology and capabilities that will support our intensive engagement work over the next year and beyond. We're prototyping and testing a range of consultation and engagement tools, both in person and online, and integrating these with technology that will help us stay connected with partners and community members as our projects and discussions evolve. We're also working to get better at telling the story of what we do and the difference we're aiming to make; we're developing an integrated communications strategy and a new thought leadership program, including publications, workshops, and symposia.



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# Our evolving funding mix




*Figures are in $ millions*

## Funding

Most of Waterfront Toronto's money comes from governments, although the share of revenue from other sources varies from year to year. Last year, for instance, the sale of land meant that funds from government represented a smaller proportion of our budget. All our funding—whether from government, land sales, or other sources—is dedicated to waterfront revitalization.





## 2018/19

| | |
|---|---|
| **From government,** of which $249m is for the Port Lands (p. 24) | **253.6m** |
| **From other sources** | **55.9m** |
| **Borrowing** [a] | **11.9m** |
| **Realized funding from prior years** | **3.0m** |

**Total investment this year:**

# $324.4m

[a] We expect that future surplus funding—outlined in Appendix II—will enable us to repay this loan in full by 2019/20. This repayment schedule conforms to the borrowing consent we've received from the three orders of government, which is valid through fiscal 2019/20.



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## Cash flow management

Once secured through an executed agreement, Waterfront Toronto's government funding is predictable, which reduces uncertainty as we plan cash flow for major capital projects. In 2018/19, government funding constitutes 78% of our funding, as discussed on page 55.

To manage the risks and complexities associated with our other funding sources—such as land and lease sales, parking revenues, and other income—we use prudent cash flow management and forecasting approaches. Our cash flow projections undergo regular review by internal and external stakeholders. Waterfront Toronto's finance team assesses cash flow monthly to ensure that we're able to meet our financial obligations and reliably deliver on our mandate. Other key stakeholders—including the Finance and Audit Committee of our Board, government partners, and lenders—review our position and projections on a quarterly basis.

## Resilience & risk management

Waterfront Toronto navigates a complex business environment: our waterfront revitalization work involves a range of major infrastructure projects, as well as diverse partners and stakeholders. Our risk management framework includes analysis of the risks associated with individual capital projects, as well as those that stand to affect our entire enterprise.

Over the past 17 years, we've been successful in managing and mitigating the risks associated with long-term infrastructure development. Our risk management approach has been developed by our senior management team and internal committees, and overseen and approved by our Board.

One of our key organizational objectives for 2018/19 is to further strengthen our risk management strategies to account for the more ambitious scale at which we're now investing. We're planning measures to ensure that we're well positioned to deliver on the plans laid out in this document even as our operating environment continues to evolve.

## Enterprise risk

**We define enterprise risk as:**

Unforeseen issues, not directly attributable to capital projects, that have implications for our entire Corporation.

Waterfront Toronto has an Enterprise Risk Management Taskforce that meets regularly and maintains a corporate risk register designed to identify, measure and mitigate key risks to our organization. Our internal auditors regularly review the risk register for completeness and adequacy, ensuring that it captures all major enterprise risks, assesses them adequately, and lays out appropriate mitigation plans. Internal auditors also use the risk register to determine areas for audit in the coming year. At least annually, the Finance, Audit and Risk Management (FARM) Committee reviews the risk register with the senior management team.





## Capital project risk

**We define capital project risk as:**

Unforeseen issues associated with the implementation and delivery of capital projects.

*Board oversight.* Waterfront Toronto's Board of Directors provides oversight of capital project risk through the FARM Committee, which monitors on a quarterly basis all capital projects it sees as high-risk by nature: for example, those that are high value ($50 million or more), involve unusual complexity, have special public prominence, or are subject to unknown risks such as the discovery of unexpected problems during excavation. To support the careful monitoring of high-risk capital projects, Waterfront Toronto will produce project-specific quarterly reports for the FARM Committee, covering each project's budget, scope, schedule, and risk in detail.

*Management oversight.* Waterfront Toronto contracts with a number of risk consultants, who maintain tailored risk registers for each of our major capital projects. (The Enterprise Risk Management Taskforce also draws on the consultant's project-specific analyses in developing its Corporation-wide risk assessments.) In 2017/18, Waterfront Toronto significantly enhanced and strengthened our project risk management framework by:

- *Establishing a Program Management Office (PMO).* Since its inception, Waterfront Toronto has earned a reputation for effective capital project management. As we begin to take on projects of unprecedented scale like Sidewalk Toronto and the Port Lands, we've elected to further formalize the processes by which we advance our capital projects. For example, although our Board has always provided oversight of our capital projects, we're now proposing to establish consistent and explicit prompts for Board review and feedback at particular design and construction stages.This added level of discipline and formality is meant to build confidence across all our stakeholder groups about the pace, resourcing, design and expected outcomes of the projects we're delivering for Torontonians.
- *Assembling a Peer Review Advisory Panel.* Waterfront Toronto's success to date has been powered by both in-house and contract talent: engineers, designers, planners, financial experts, community engagement specialists and many others. As we begin to make even larger and more technically sophisticated public investments in waterfront revitalization, we're drawing on some of the world's top experts in specific industry areas to support successful outcomes. For instance, we've engaged the Dutch Ministry of Infrastructure—the Rijkswaterstaat, whose flood control expertise is internationally renowned—to offer insight and feedback on the cost, schedule and construction of the re-naturalized mouth of the Don and associated infrastructure.



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# Appendix I: Planned 2018/19 deliverables detail

| Project Priority | Project Element | 2018/19 Planned Spend | 2018/19 Planned Deliverable |
|---|---|---|---|
| The Port Lands | Flood protection and city-serving infrastructure Implementation | $ 210.0m | • Complete schematic and detailed design for key project elements such as bridges, roads, and landscaping.<br>• Commence construction of the river-related project components (including the flood protection grading/foundation works covering the River South Precinct).<br>• Continuing work on the Community-Based Risk Assessment which guides our environmental management strategy for the project. |
| | Cherry Street Stormwater and Lakefilling Project | $ 38.8m | • Complete construction of new shoreline and aquatic habitat.<br>• Complete lakefilling to create about five hectares of filled area around the current Essroc Quay.<br>• Completing the above two items will mean total completion of the Cherry Street Stormwater and Lakefilling project. |
| Complete Communities | Stormwater System | $ 19.9m | • Complete installation of stormwater treatment process equipment for the stormwater facility (SWF).<br>• Install electrical equipment for the Cherry Street sanitary pumping station (SPS) in the SWF electrical room and complete final commissioning of the SPS.<br>• Complete construction of the last section of the twin storm forcemains on Queens Quay, to complete the connection from the SWF to the Bayside attenuation shaft.<br>• Complete construction of Dockside / Bayside in-water storm pipe. |
| | Queens Quay East & Parliament Street Intersection | $ 16.1m | • Complete environmental and geotechnical investigation and submit pre-submission forms to Ministry of the Environment and Climate Change.<br>• Complete design and obtain approvals for dockwall/landfilling.<br>• Negotiate acquisition of land related to road re-alignment and associated approvals. |
| | Bayside Phase 2 | $ 6.4m | • Complete construction and landscaping of Phase 2 local streets and public realm.<br>• Close land transaction with Hines/Tridel for Block 6 in Bayside to enable the construction of a $320 million, 420,000 square foot residential condominium building with a City-run community centre. |
| | Bayside Phase 1 | $ 4.5m | • Complete construction of Aitken Place Park (target completion by September 2018).<br>• Complete construction of Phase 1 public realm for Bonnycastle Street.<br>• Complete occupancy of the first residential building, Aquavista, a $205 million building that includes 227 condominium units, 80 affordable rental units, and a City-run day care facility. |
| | Dockside | $ 1.3m | • Complete construction of Dockside Block 1 dockwall reinforcing.<br>• Complete construction and acceptance for streets. |





| Project Priority | Project Element | 2018/19 Planned Spend | 2018/19 Planned Deliverable |
|---|---|---|---|
| | West Don Lands Phase 1 | $ 1.1m | • Assist developer with obtaining building permits for River City Phase 4 to facilitate the construction of an $80 million, 122,000 square foot residential condominium building. |
| | Broadview and Eastern Flood Protection EA | $ 0.8m | • Complete phase 1 of environmental assessment process. |
| | Villiers Island Precinct Plan | $ 0.5m | • Start the planning approvals for Phase 1—zoning and Plan of Subdivision. |
| | West Don Lands Phase 2 | $ 0.4m | • Assist in obtaining municipal approvals for Block 12/Canary Phase 4 to allow the construction of a $200 million, 331,000 square foot residential condominium building.<br>• Achieve municipal approvals on Block 13, Canary Phase 5, a $380 million, 550,000 square foot residential condominium building and Block 10, a $200 million, 296,000 square foot mixed-use development with Anishnawbe Health Toronto which includes a community health centre, hotel and purpose-built market rental. |
| | Parkside | $ 0.1m | • Liaise with Menkes as they begin construction of Waterfront Innovation Centre, a $200 million, 400,000 square foot commercial building.<br>• Begin occupancy of Monde, a $320 million, 476,000 square foot residential building. |
| | Queens Quay Bay to Spadina Revitalization | $ 2.6m | • Transfer temporary overhead power connections to the new underground system and replace older hydro poles with WT's signature light poles. |
| Quayside (Sidewalk Toronto) | Quayside Development/ The Port Lands | $ 3.6m | • Undertake additional environmental studies for development blocks/sites.<br>• Negotiate key terms and execute definitive documents.<br>• Draft Master Innovation and Development Plan for Quayside and Eastern Waterfront.<br>• Council approval of Business Implementation Plan for Quayside and areas of Eastern Waterfront in consultation with the City of Toronto.<br>• Start process for municipal approvals.<br>• Start process to select a development partner for the first development block in Quayside.<br>• Commence Ontario Municipal Board hearing/settlements on Central Waterfront Secondary Plan.<br>• Commence North Keating Precinct Plan for 480 Lakeshore and work with City of Toronto on McCleary District Precinct Plan. |



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# Appendix I: Planned 2018/19 deliverables detail

| Project Priority | Project Element | 2018/19 Planned Spend | 2018/19 Planned Deliverable |
|---|---|---|---|
| Public Places | Public Art | $ 3.5m | • Complete procurement and substantially complete the installation of public art at the King/Queen Triangle in West Don Lands.<br>• Complete public engagement, procurement, and design of "Destination" public art piece at Water's Edge Promenade in Bayside Phase 1. |
| | The Bentway | $ 2.2m | • Complete soft-scaping, electrical lighting installation, and testing and commissioning of equipment. |
| | Jack Layton Ferry Terminal Phase 1A | $ 1.0m | • Complete construction of Phase 1A by May 2018. |
| | York Street Park | $ 0.8m | • Complete public design competition to procure park design team.<br>• Complete design and obtain approvals for park construction. |
| | Rees Street Park | $ 0.1m | • Complete public design competition to procure park design team. |
| Strategic Initiatives | Innovation and Sustainability | $ 0.4m | • Define a Climate Positive Roadmap with the C40 Cities Climate Positive Development Program, aiming to lower net annual greenhouse gas emissions in new developments like Quayside and Villiers Island.<br>• Work with the broader team on the Quayside development project, establish ambitious, precedent-setting targets to achieve greater sustainability outcomes.<br>• Update the Minimum Green Building Requirements to provide more ambitious targets more effectively align with other green building standards.<br>• Work with Beanfield Metroconnect, continue activation of Wi-Fi in the waterfront public realm.<br>• Launch an interim-use urban innovation lab on the Quayside site, in collaboration with industry partners. |
| | Affordable Housing Initiative | $ nil | • Complete model for Affordable Housing Pilot Project. |
| Eastern Waterfront Transit | Waterfront Transit | $ 0.3m | • Complete Waterfront Transit Reset and provide recommendations to City Council regarding a preferred transit plan for the Eastern Waterfront. |



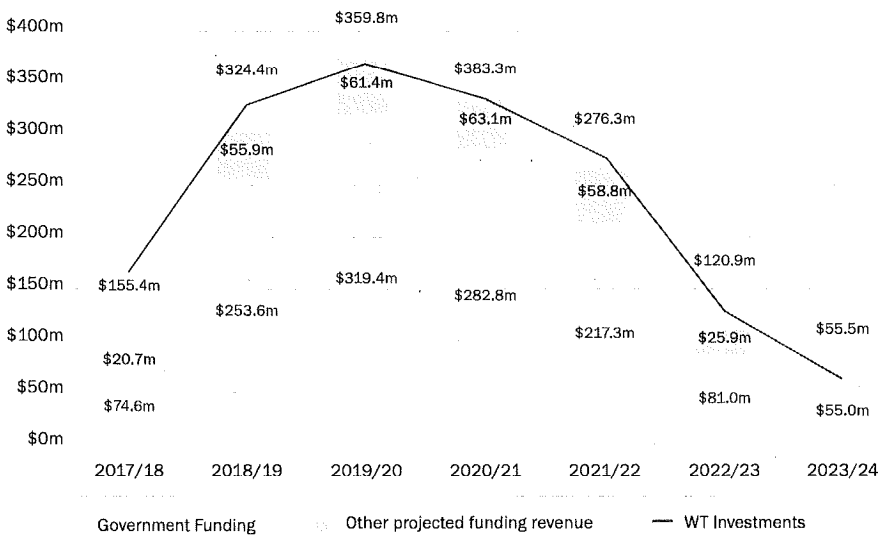


| Project Priority | Project Element | 2018/19 Planned Spend | 2018/19 Planned Deliverable |
|---|---|---|---|
| Core Support Functions | Indirect Corporate Operating (core support staff, tools, technology, occupancy, insurance and audit fees to support project delivery teams and governance framework) | $ 8.2m | • Complete office space reconfiguration to support staff head count and create additional collaborative spaces.<br>• Develop five-year strategic business plan for approval by Board in December 2018.<br>• Fully implement Enhanced Governance & Risk Framework at both enterprise-wide and capital project levels.<br>• Implement formal Performance Measurement Reporting Framework to track and report outcome-based measures.<br>• Develop new employee performance management framework.<br>• Implement enterprise content management strategy that includes retention and digitization principles for managing content throughout lifecycle.<br>• Roll out integrated communications strategy including new corporate narrative in all public-facing communications and engagement activity (such as staff and board training with elevator pitches, case for support materials, and key messaging; new standard presentation and templates; proactive media relations; external public relations and government relations support as required).<br>• Undertake prototyping and testing of new engagement methods—both in-person and digital—including multiple scales of pop-up consultation and engagement, developing catalogue of consultation and engagement tools, and building up internal capacity for facilitation and engagement.<br>• Develop Facebook application for digital public consultation, with integration to new Customer Relations Management database.<br>• Integrate programming strategy with public engagement overlay.<br>• Develop and implement thought leadership strategy encompassing speaking engagements, workshops, white papers, symposia, and publications. |
| Others | Other Costs | $ 1.8m | |
| **Total** | | **$324.4m** | |



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# Appendix II: Capital investment plan and funding strategy




| **Breakdown of Capital Investment Plan** | **2017/18** | **2018/19** | **2019/20** | **2020/21** | **2021/22** | **2022/23** | **2023/24** | **Total** |
|---|---|---|---|---|---|---|---|---|
| The Port Lands | $ 65.0 | $ 248.8 | $ 314.0 | $ 279.0 | $ 206.0 | $ 81.0 | $ 55.0 | $ 1,248.8 |
| Complete Communities | 54.0 | 55.0 | 24.7 | 43.8 | 46.1 | 14.9 | - | 238.5 |
| Public Realm | 22.1 | 7.8 | 8.5 | 7.1 | 8.9 | 7.7 | - | 62.1 |
| Quayside (Sidewalk Toronto) | 1.9 | 3.6 | 3.7 | 1.7 | 0.2 | 2.5 | - | 13.6 |
| Strategic Initiatives | 2.6 | 0.7 | 0.8 | 0.3 | 13.0 | 12.8 | - | 30.2 |
| Eastern Waterfront Transit | 2.3 | 0.3 | - | - | - | - | - | 2.6 |
| Core Support Functions | 7.5 | 8.2 | 8.1 | 6.4 | 2.1 | 2.0 | 0.5 | 34.8 |
| **Waterfront Toronto Total** | **$ 155.4** | **$ 324.4** | **$ 359.8** | **$ 338.3** | **$ 276.3** | **$ 120.9** | **$ 55.5** | **$ 1,630.6** |

*Figures are in $ millions*





| **Key Projects for 2018/19** | **Fiscal Year 2018/19** | **Fiscal Year 2019/20** | **Fiscal Year 2020/21** |
|---|---|---|---|
| The Portlands | $ 248.8 | $ 314.0 | $ 279.0 |
| The Port Lands Flood Protection & Enabling Infrastructure Implementation | 210.0 | 314.0 | 279.0 |
| Cherry Street Stormwater and Lakefilling project | 38.8 | - | - |
| Complete Communities | $ 55.0 | $ 24.7 | $ 43.8 |
| Stormwater System | 19.9 | 2.6 | 0.3 |
| Queens Quay & Parliament Street Intersection | 16.1 | 10.0 | 22.5 |
| Bayside Phase II | 6.4 | 7.1 | 3.5 |
| Bayside Phase I | 4.5 | 2.4 | 0.1 |
| Dockside | 1.3 | 0.2 | 2.6 |
| Queens Quay Bay to Spadina Revitalization | 2.6 | 0.1 | 0.1 |
| WDL Phase I Development | 1.1 | 0.0 | 0.0 |
| Broadview & Easten Flood Protection EA | 0.8 | - | - |
| Villiers Island Precinct Plan | 0.5 | 0.3 | - |
| WDL Phase II Development | 0.4 | 0.2 | 0.1 |
| Parkside | 0.1 | 0.0 | - |
| Boardwalks | - | - | 7.5 |
| Community Facilities | - | - | 5.6 |
| Other | 1.3 | 1.8 | 1.5 |
| Public Places | $ 7.8 | $ 8.5 | $ 7.1 |
| Public Art | 3.5 | 2.4 | 3.1 |
| The Bentway | 2.2 | - | - |
| Jack Layton Ferry Terminal | 1.0 | - | - |
| York Street Park | 0.8 | 6.0 | 4.0 |
| Rees Street Park | 0.1 | - | - |
| Other | 0.2 | 0.1 | 0.0 |
| Quayside (Sidewalk Toronto) | $ 3.6 | $ 3.7 | $ 1.7 |
| Quayside Development / Port Lands Planning | 3.6 | 3.7 | 1.7 |
| Strategic Initiatives | $ 0.7 | $ 0.8 | $ 0.3 |
| Innovation & Sustainability Initiatives | 0.4 | 0.3 | 0.3 |
| Other | 0.3 | 0.5 | - |
| Eastern Waterfront Transit | $ 0.3 | $ - | $ - |
| Core Support Functions | $ 8.2 | $ 8.1 | $ 6.4 |
| **Waterfront Toronto Total** | **$ 324.4** | **$ 359.8** | **$ 338.3** |

*Figures are in $ millions*



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SIDEWALK LABS

October 17, 2017

Since its inception, Sidewalk Labs has been conducting a thought experiment with leading urbanists and technologists about what the city of the future might look like—and scouring the globe for a place to bring it to life.

In March 2017, Waterfront Toronto issued Request for Proposals No. 2017-13, a call for an innovation and funding partner for Toronto's Eastern Waterfront. After all of our searching, we knew this was the perfect place, and the perfect partner.

Our response to Waterfront Toronto's RFP represented a snapshot in time of our ideas about how to create a place that deployed emerging technology and people-first design innovations to address the challenges that face growing cities—and how we might realize this vision on Toronto's Eastern Waterfront.

We've decided to release the vision we laid out in our response, both in the interest of transparency and to start what promises to be a history-making public conversation. We hope all Torontonians—and city-lovers far and wide—will join in. Which urban challenges are most urgent? Where can technology prove useful in finding solutions, and where is it not the right tool? Which of our ideas are great, which are crazy, and what did we miss?

We need your ideas, your aspirations, your critiques, your concerns. We hope you'll email us, call us, tweet at us, and, if possible, join us in person at a series of public conversations, beginning with a Community Town Hall in early November.

We couldn't be more honored to have been selected by Waterfront Toronto to do something historic on the shore of Lake Ontario. And we couldn't be more excited than to do it together in partnership with you.

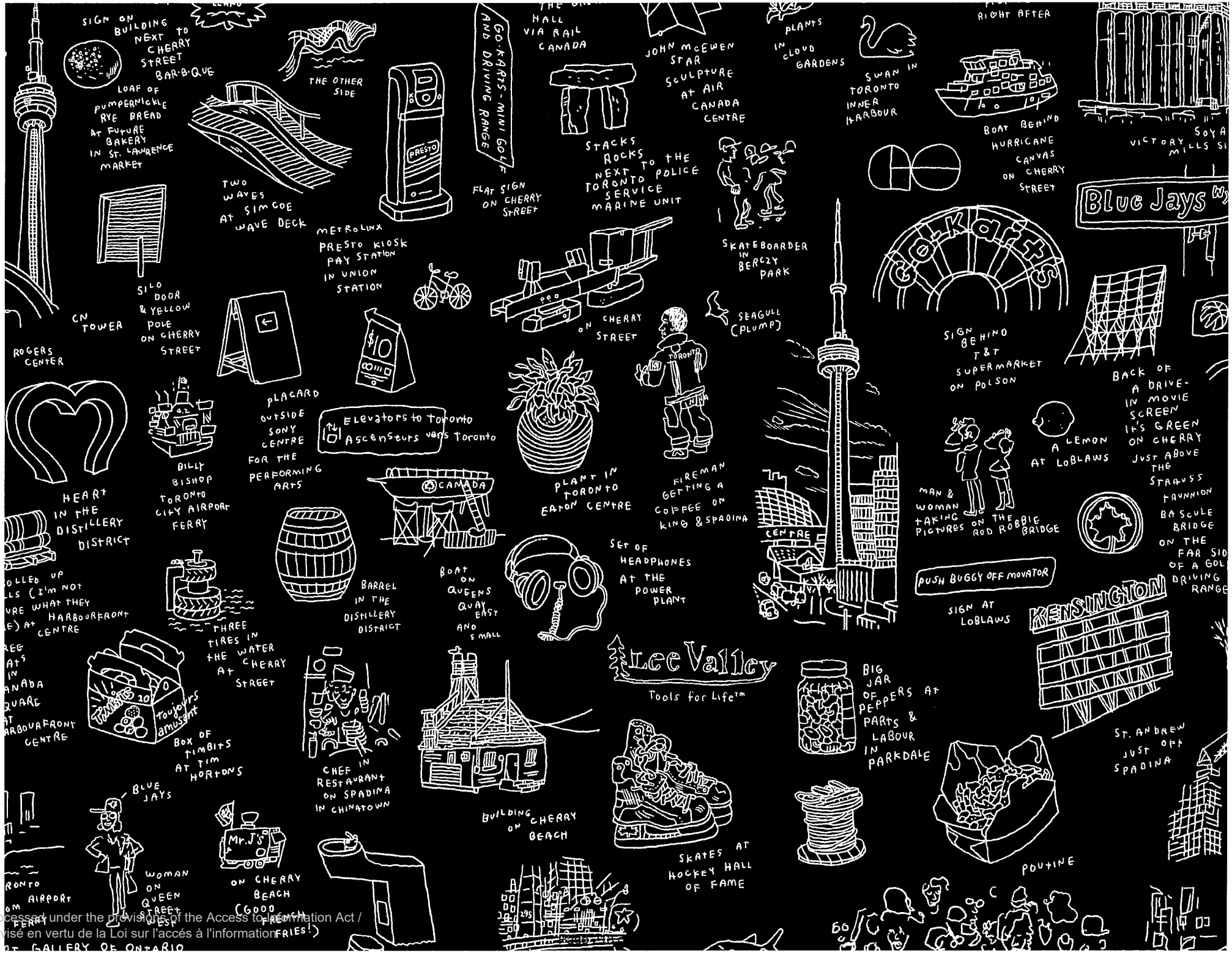
Daniel L. Doctoroff

— Daniel L. Doctoroff
CEO, Sidewalk Labs

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A1

# Vision



A1 a
## VISION

**i. A new type of place.** Toronto is a city of neighbourhoods at heart, and the Eastern Waterfront is its next frontier—a great undeveloped outlet that can set a new standard for downtown communities and help relieve the pressures of the city's remarkable growth. In Quayside, Waterfront Toronto has the opportunity to create a neighbourhood that lives up to the city's planning principles of livability, connectivity, prosperity, and resilience. As the innovation and funding partner for Quayside, Sidewalk Labs, an Alphabet subsidiary and sibling company to Google, will accelerate these plans for inclusive growth by merging the physical and digital realms, creating a blueprint for the 21st-century urban neighbourhood.

Quayside will celebrate the waterfront's shipping heritage, its remaining industrial icons, and its origins as a public promenade. It will be a truly complete community, blending work, home, and play throughout the neighbourhood, within every building, and even on the water. Instead of orienting the built environment around cars and condos, Quayside's public realm will centre on bike paths and pedestrian laneways. The neighbourhood will prioritize placemaking, with an adaptable mix of building uses and amenities that stay active at all hours of every day.

Quayside will feel like no other neighbourhood in Toronto—or, indeed, the world. The neighbourhood will be a bustling digital and civic workshop open to all, and its streets will be filled with exploration. When people look around Quayside, they might see a retail shop turning into artist housing as part of a flexible building pilot. Or a self-driving shuttle dropping off passengers during a test ride. Or a community group using a digital kiosk to provide feedback on a local planning discussion. Or a new urban innovation institute, home to a campus of entrepreneurs itching to solve the toughest problems facing cities.

Welcome to Quayside, the world's first neighbourhood built from the internet up.

Quayside will be a new type of place, with connectivity designed into its very foundation. It will blend human-centred urban design with cutting-edge digital technology, cleantech, and advanced building materials. It will be a global testbed where people can use data about how the neighbourhood works to make it work better. It will serve as connective tissue—going above, below, and around the Gardiner Expressway to improve access to Toronto's waterfront. And it will reflect the city's exceptional diversity.

But what happens in Quayside will not stay in Quayside. The ideas first tested there will take on new life when deployed at scale across the Eastern Waterfront district. Modular housing piloted in Quayside can produce whole neighbourhoods of lower-cost, quicker-to-build housing, enabling the market to meet burgeoning demand. A self-driving shuttle can bloom into a next-generation transit system that provides point-to-point convenience without the safety risks and high costs of private cars. A thermal grid pilot can become the foundation of a district-wide energy system that sets a global example for climate-positive living.

Integrating new technology into the urban environment is hard. The technologists who produce ambitious solutions do not speak the same language as the urbanists who must find ways to implement them. Today no single city stands as a model for a brighter urban future.

In Quayside, the physical and the digital will converge into a platform for urban innovation, accelerating the pace of solutions. As this platform scales across the Eastern Waterfront, it will catalyze an industry at the intersection of cities and technology that exists nowhere else in the world. Just as Silicon Valley is the centre for digital technology and New York is the centre for finance, the Eastern Waterfront can help make Toronto the global hub for urban innovation. This ecosystem will build off Toronto's natural strengths: its diversity, strong public institutions and universities, and rising tech presence, bolstered by recent investments in artificial intelligence.

The moment is right for a vision of historic sweep. The world sits on the cusp of a revolution in urban life every bit as transformative as the arrival of the steam engine or electricity, powered by a new set of digital and design breakthroughs. With Quayside as its launchpad, the Eastern Waterfront will be a place where people and companies come to engineer solutions to tough urban growth challenges, and to export the ideas sparked in Toronto far beyond the mouth of the Don River.

**ii-iii. Partnering to achieve it.** Sidewalk was formed to lead an urban innovation project of great consequence. Alphabet (then Google) launched Sidewalk with the belief that emerging technology—if truly integrated into the physical environment—can help cities address seemingly intractable challenges. Sidewalk has spent the past two years studying more than 100 efforts to create urban innovation districts and

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producing a comprehensive vision on building a city in the internet era.

As an innovation partner to Waterfront Toronto, Sidewalk will contribute a unique combination of technology, urban development expertise, and flexible funding approaches. Sidewalk will seek from Waterfront Toronto and its team the expertise gained from years of successful waterfront planning and development; coordination of city, province, and federal support; sourcing of local partners and expertise; and a joint approach to master planning consistent with Toronto's long-term development objectives.



Sidewalk envisions a phased governance structure (described further in **A5-a**) that ensures close collaboration with Waterfront Toronto and the opportunity for community engagement in defining the project vision, while preserving the flexibility to collaborate with market-leading partners for specific implementations. During the initial phase, joint approval of a master development plan will be a key governance principle to ensure that the visions of Sidewalk and Waterfront Toronto are aligned. Sidewalk and Waterfront Toronto will form a senior working group to make key decisions, consulting with local stakeholders and an advisory board to be highly responsive to the community.

**iv. Why Sidewalk is unique.** As the marriage of Google engineers and government leaders who changed the face of New York City, Sidewalk is the only urban innovation company built expressly to bridge the divide that exists between urbanists and technologists. Sidewalk merges the iterative thinking and challenges to convention that brilliant technologists do so well with the placemaking know-how and local sensitivity that savvy urbanists bring to the table.

As an Alphabet subsidiary, Sidewalk will deliver its parent company's unparalleled expertise and reputation to spark a new industry around urban innovation in Toronto. No one else has envisioned the integration of technology into the physical environment that will give rise to an urban innovation platform and inspire a new generation of creative minds to invent tools for city living. Sidewalk's presence will signal to aspiring engineers, urban designers, and entrepreneurs that a career helping cities meet their challenges is possible along the Eastern Waterfront.

Most critically, Sidewalk's vision puts people at the heart of its objectives. Technology is never the end goal, but rather a tool that empowers people to improve quality of life. The world does not need another plan that falls into the trap of treating the city as a high-tech island. A new neighbourhood or district must be cheaper to live in, cleaner to breathe in, safer to travel in, easier to find work in. Otherwise, why build it?

Waterfront Toronto and Sidewalk share the goal of turning the Eastern Waterfront into the most innovative urban district in the world. Implementing this vision together can help Toronto address its growth challenges; ignite an urban innovation cluster where new industries thrive, new skills are learned, and small businesses scale; and create a replicable model for the world.

A1-b
## URBAN CHALLENGES



**i. Growing pains.** Many of Toronto's most pressing challenges are the result of its success. High-demand cities around the world, from New York to London, struggle to maintain the character of their neighbourhoods and the socioeconomic diversity of their people as housing prices, congestion, and costs of living soar, and Toronto is no exception. At the same time, the global threat of climate change has put the spotlight on cities in search of solutions, with Toronto becoming a respected leader in this urgent pursuit.

The cities that emerge stronger from these challenges will be those that manage growth equitably, affordably, and sustainably. Toronto is on the right track with its plan for the city centre that prioritizes dense, mixed-use building, investment in transportation and infrastructure, and climate-sensitive development. But it has to move faster to achieve inclusive growth. Chief Planner Jennifer Keesmaat articulated the balancing act required in Toronto's official plan: "Our choice is not whether we grow, but how well we grow."

Of course, many challenges in Toronto go beyond growth. Condos along the waterfront alone cannot explain the startling rise in single-family home prices; that is also a problem of housing supply being unresponsive to demand. Likewise, while rising costs exacerbate income inequality, the greater force at work is a global economy that has stopped providing the middle-class job opportunities and wage growth it has delivered in the past.

These challenges impact Torontonians every day in the form of reduced quality of life and opportunity. It is the Ryerson graduate who cannot afford to get her own place, the service worker who spends hours of his life sitting in traffic on the Gardiner, the family that cannot find enough space to live

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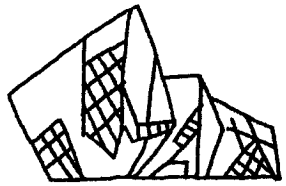
a distributed network of sensors to collect real-time data about the surrounding environment, enabling people to measure, understand, and improve it. A Map component collects location-based information about the infrastructure, buildings, and shared resources in the public realm. An Account component provides a highly secure, personalized portal through which residents can access public and private services. A Model component (in development by Sidewalk's Model Lab) can simulate "what if" scenarios for city operations to inform long-term planning decisions.

The physical layer is essentially the core infrastructure that frames any city: utility channels to carry wires, waste, and water; a street grid to direct movement; a public realm to provide an array of parks and amenities. Sidewalk's approach to the physical layer is designed to be adaptable. For instance, unlike traditional utility networks, which are buried in roads and therefore disruptive and costly to change, flexible utility channels will be easily accessible and reserve space for new connections, saving time and money on upgrades and installation. The physical and digital layers will connect via sensors to generate a shared repository of data on the neighbourhood that is critical not only for day-to-day operations but also for public agencies and third parties working to improve services—empowering people to build solutions faster than is possible in cities today.

The platform's standards layer defines the rules for residents, administrators, and developers using and building atop the platform. Good platforms encourage the most innovation and collaboration with the fewest barriers to entry. The platform must attract participants by being open, and it must connect producers of new goods and services with consumers. The platform must have clear data standards and well-supported application programming interfaces (APIs) to accelerate development. And the platform must have an uncompromising and transparent approach to data and privacy protection.

To jumpstart the urban innovation platform, Sidewalk is developing a series of concepts noted below. These ideas should not be seen as rigid solutions but rather approaches to urban growth challenges that provide an initial demonstration of the platform's capabilities, and that are open to refinement through partnership with Waterfront Toronto.

**The next frontier of global sustainability.** Toronto's sustainability trends around transportation and electricity consumption are encouraging, with electric vehicle ownership rising and great strides being made on cleaner electricity. But as the Quayside Draft Vision Document points out, there is still a lot of progress to be made reducing emissions that come from building energy, waste, and water use.



As the centrepiece of a new approach to building energy in Quayside, Sidewalk will pilot a thermal grid that taps multiple existing sources of energy for circulation and reuse, making it possible to heat and cool buildings without fossil fuels. Sidewalk will also capture enough renewable energy through an advanced microgrid to meet Waterfront Toronto's goals for onsite power generation. And Sidewalk will adopt Passive House building standards that go beyond LEED to manage the thermal load that is the largest cause of energy demand in buildings.

Sidewalk will complement these efforts with a suite of innovations that target reductions in waste and water use. To reduce construction waste, Sidewalk will experiment with more eco-friendly building materials, such as tall timber. Sidewalk will seek to pilot a smart disposal chain in multifamily buildings that consists of sensor-enabled waste separation for recycling and onsite anaerobic digestion for composting, dramatically reducing landfill waste. And an intuitive purple-pipe pilot will help tenants reuse greywater.

These components can help make Quayside a zero-emissions neighbourhood and introduce the next generation of sustainable buildings.

**Real estate that is flexible and far more affordable.** Housing is the single biggest expense facing Toronto families, and the toughest barrier to inclusivity. To make Quayside a complete community, Sidewalk has developed several tools that help achieve affordability—from technology that lowers construction costs to innovative financing and partnerships with government.

In Quayside, Sidewalk plans to deliver **modular** buildings using advanced manufacturing to save time and money during construction. Sidewalk will also demonstrate a flexible building typology, Loft, with a strong shell and minimalistic interior that makes it quick and easy to convert building uses. To enable adaptable buildings while ensuring good standards, Sidewalk will test outcome-based codes, using embedded sensors to monitor for negative impacts such as noise or pollution. Sidewalk will also explore new occupancy models that rely on


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shared space, such as co-housing, to further lower housing costs.

Drawing on its long history developing affordable housing in New York City, the Sidewalk team will pursue innovative financing approaches in Quayside. Sometimes the best fit will be a partial homeownership program; other cases may require a rental subsidy. Critically, affordable housing in Quayside will not be relegated to separate buildings; Sidewalk's approach will be for residential facilities throughout the neighborhood to house residents with a range of incomes.

These strategies can make housing more efficient and affordable and encourage socioeconomic diversity.

**A mobility system as convenient as private cars at much lower cost.** The biggest challenge to sustainable mobility in Toronto is finding ways for transit to compete with the private car in terms of convenience for daily trips—a struggle exacerbated by limited transit funding. In Quayside, Sidewalk plans to use both traditional transit and digital mobility tools to offer efficient alternatives to driving, all at lower cost than owning a car.

Sidewalk's approach begins by restricting conventional vehicles (non-emergency) from a large portion of the neigbourhood after a transition zone. But that is not enough. For trips within Quayside, Sidewalk will provide a robust walking and biking infrastructure, including expansions of Bike Share Toronto. Working with Waterfront Toronto and the city, Sidewalk hopes to extend transit links to the waterfront—specifically, the 501 and 514 streetcar routes. Sidewalk will also pilot a self-driving transit shuttle, a strategy identified in the Quayside Draft Vision Document.




For trips outside Quayside, Sidewalk's approach is to reduce the need for private cars, or manage their impact when transit is not convenient. An adaptive traffic light pilot (being incubated by Sidewalk's Semaphore Lab) will use sensing technology to detect pedestrians and cyclists and prioritize their safe movement through congested intersections. A managed parking pilot (being developed by Sidewalk's portfolio company Flow) will direct cars to available parking, reducing the emissions and congestion caused by circling. A mobility-as-a-service platform will help users take advantage of all mobility options, and will facilitate an on-demand shared ride system. Finally, Sidewalk will create an urban freight transit system, using robots to make deliveries via utility channels.

These initiatives will help make Quayside one of the least auto-dependent neighbourhoods in Toronto, saving families thousands of dollars a year in car-ownership costs.

**A public realm that is vibrant and usable year-round.** Toronto's Jane Jacobs spent her life encouraging cities to improve their shared spaces, because ultimately the public realm defines a neighbourhood. But bad weather can deter people from gathering outdoors, and limited insight into usage patterns and conditions makes public spaces hard to maintain.

Sidewalk's approach to the public realm centres on returning it to pedestrians and making it more usable more often. Awnings set out in bad weather are as old as the souk, but emerging capabilities and technologies, such as durable plastics like ETFE, enable new approaches to weather mitigation and all-season infrastructure that can draw people outdoors. In Quayside, Sidewalk will pilot retractable canopies in public spaces and heated bike and pedestrian paths to melt snow.

Sidewalk also will pilot a public realm management system, enabled by sensor arrays, that monitors air quality, asset conditions, and usage, helping managers respond quickly to emerging needs, from broken benches to overflowing waste bins. This system will enable tests of reservable outdoor spaces for short-term uses, such as pop-up shops. Using flexible building structures, Sidewalk is exploring a next-gen bazaar, a tech-enabled makerspace with activity stalls that can be refreshed quickly.

These capabilities can help make public space more usable for as much of the year as possible—and as familiar and comfortable as a living room or a backyard.

**A close-knit community that uses data to improve city services.** Social cohesion and civic engagement are an ongoing challenge in growing cities, but new data and digital tools can be put to work for a stronger community. Sidewalk portfolio company Intersection is at the forefront of connected communities: its LinkNYC system is the world's largest free public Wi-Fi network, and its connected program at Hudson Yards in New York City enables a vast array of neighbourhood experiences, including amenity reservations and digital feedback channels.

In Quayside, Sidewalk will pilot a neighbourhood assistant tool to facilitate social cooperation and

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First are the unique properties of the Eastern Waterfront itself. It is close enough to feed on the energy of Toronto's booming core, but still removed enough to function as a place of experimentation. Add to that its size, sparse population, and guidance from Waterfront Toronto, and the Eastern Waterfront provides a singular canvas on which to apply the concept of an urban innovation platform.

The site is large enough to support a dozen or more distinct neighbourhoods—a system of "networked neighbourhoods." Across the waterfront, the streets will restrict conventional vehicles, with a mobility network primarily serving pedestrians, cyclists, and taxibot transit. A free-flowing public realm will emphasize flexible pavilions and radical mixed-use, bringing home, work, and play closer together. A green ribbon of parks will surround the district, and a series of blue "water rooms"—from floating theatres to homes—will create new life on the lake.

Second is the scale of impact that can be achieved by innovation on a site of hundreds of hectares. A Loft pilot at Quayside can create radical mixed-use for hundreds of people; this same concept, applied across the Eastern Waterfront, means transforming the speed at which the built environment evolves for tens of thousands of Torontonians. A smart disposal chain deployed in Quayside will make it easy to bring composting to multifamily buildings; this same concept, applied across the Eastern Waterfront, becomes a robotic sorting system that diverts more than 90 percent of waste without the hassle of manual separation. A cluster of Passive House buildings at Quayside will climb the learning curve and make it possible for the Eastern Waterfront to be entirely Passive House at no incremental cost.

Third is the combined impact that occurs when boundless innovation comes together in cross-cutting ways. When a mobility-as-a-service pilot in Quayside scales across the Eastern Waterfront, it not only enables families to abandon auto-ownership without sacrificing convenience, it also combines with self-driving shuttles to turn every corner into a transit stop. By eliminating the need for parking, this new mobility system further combines with flexible Loft structures and programmable public space to repurpose land for whatever the community needs most, from affordable housing to cultural institutions. And the system combines with the advanced microgrid to fuel electric vehicles with renewable energy and off-peak power, keeping the air cleaner.

The examples go on. The public realm is enhanced by utility channels that put an end to disruptive street work and enable robots to transport solid waste underground and out of sight. Flexible buildings are supported by an outcome-based code that, at full scale, prevents nuisances and safety risks while dramatically reducing the restrictions on how indoor spaces are used. The microgrid is complemented by a thermal grid that can tap vast sources of waste heat and natural cooling, enabling the Eastern Waterfront to export clean thermal energy to downtown neighbourhoods and achieve Waterfront Toronto's climate-positive ambition.

In this way, the networked neighbourhoods of the Eastern Waterfront will begin to operate at a system scale, like the internet, generating advantages that increase with each new node. Whereas a neighbourhood of a few thousand people will produce a modest market opportunity to attract third parties to the platform, a district of networked neighbourhoods will be powerful enough to draw companies and entrepreneurs from all over to take part in Toronto's new ecosystem.

Which leads to the fourth and final theme: the opportunity for people to create things that no one can yet imagine. Some of these things will be digital applications built on top of the platform. When the internet first emerged as a small network of researchers, who envisioned that it would one day transform the way people navigate city streets? And cities themselves will change in unknowable ways once the traditional rules of urban planning disappear. When planners no longer need to orient streets around cars, developers no longer need to distinguish land uses, and communities no longer need to choose between an affordable home and a reasonable commute, the physical environment becomes an extension of human creativity, rather than a barrier to it.

For more detail on how innovations applied in Quayside will have a transformative impact across the Eastern Waterfront, see **Appendix A.**

## A1 f TRANSFERABILITY



Sidewalk's approach for Quayside is designed to achieve both a successful urban development project and to maximize transferability of the solutions that emerge on a global scale. Everything will have a dual purpose: inclusive growth for Toronto, and a demonstration project for cities everywhere to look to and learn from.

As local laboratories of innovation, cities have always copied the best practices of other cities. Sidewalk leaders learned that lesson time and again during their tenure in city government. New York City's

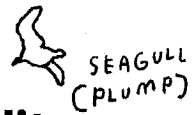
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High Line inspired dozens of cities to create similar projects with abandoned infrastructure. The PlaNYC sustainability initiative set a new standard for managing growth while protecting the climate. C40 cities institutionalize this practice to help each other implement ideas systematically.

Of course, before cities and developers copy ideas, they must see that a new concept has worked. Sidewalk expects Quayside to become the most measurable community in the world. Nowhere else will researchers have access to a well-supported, standardized data platform, and models that enables rapid urban innovation—a "city with an API." At a new urban innovation institution in Quayside (described more in **A4-a**), researchers will be able to analyze data to demonstrate which concepts being tested in the living laboratory are improving quality of life, and which are not. As innovations show their promise, their usage will transfer outward—first to Toronto, then beyond.

As more concepts prove their success, and more cities copy them, more urban innovators will come to Quayside to pursue their own ideas. This positive feedback loop for Toronto will catalyze an innovation marketplace in Toronto, consistent with recent recommendations from Canada's Advisory Council on Economic Growth.

A3




# Sustainability and Innovation

Sidewalk's approach to sustainability in Quayside is to pilot and scale different kinds of innovation to tackle the thorniest problems in environmental performance. Despite tremendous strides on climate action in Toronto, the state of the art today is insufficient to achieve the levels of greenhouse gas reductions the planet needs, let alone realize Waterfront Toronto's vision of a climate positive community. Achieving that high bar requires aggressive innovation around mobility (detailed in **A3-b**) and electricity, but Sidewalk sees an opportunity in Toronto to make the biggest impact on resource consumption around building energy. Through a sustainability strategy centring on thermal energy capture, Quayside has the potential to be nearly climate positive in its early phases, and the Eastern Waterfront can achieve climate-positive status.

A3-a

## APPROACH TO BUILDING-LEVEL SOLUTIONS

**Flexible buildings that reduce energy demand.** A critical aspect of Sidewalk's vision for buildings is incorporating flexibility and mix of uses into each structure. This approach has many benefits, including future-proofing structures to reduce construction and demolition waste, and enabling dense, mixed-use developments that encourage walking and cycling. Different building uses also generate complementary thermal demands, which makes thermal exchange systems more effective.

In Quayside, Sidewalk also sees the opportunity to experiment with new construction techniques and designs that will eliminate the waste that occurs from building construction and demolition, including modular housing and flexible construction. Sidewalk has also been experimenting with more sustainable building materials, including mycelium insulation and tall timber skeletons, and intends to pilot such structures in Quayside as a first step to adoption in the Eastern Waterfront.

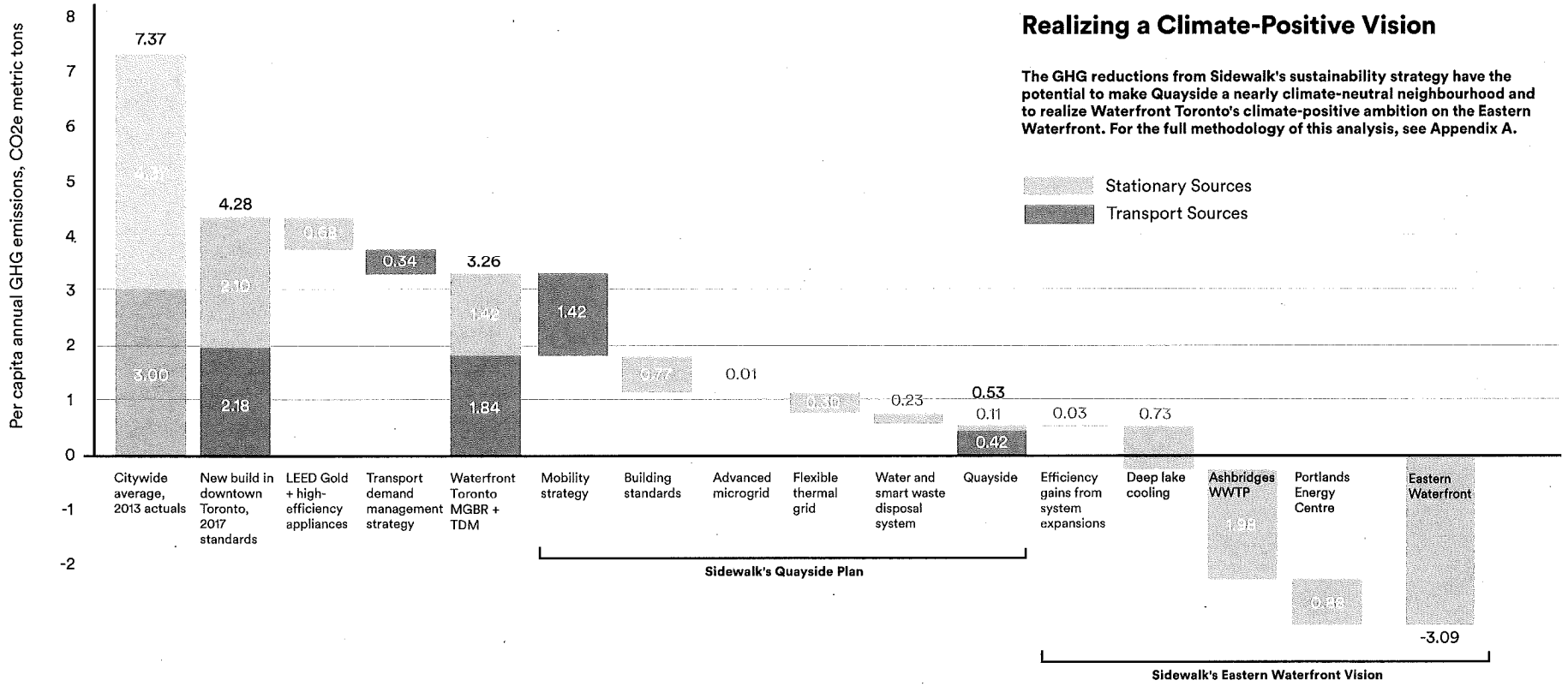
**The MGBR and beyond.** Waterfront Toronto's Minimum Green Building Requirements set an admirable baseline, but Sidewalk is eager to go beyond them. For overall energy consumption, Sidewalk plans to use the Passive House standard as a baseline. With a cluster of Passive House–inspired buildings, Quayside will serve as a laboratory for the refinement of this standard as it applies to North American multifamily buildings. Further, Sidewalk seeks to explore the effectiveness of different types of building controls, which are among the most potent ways to reduce energy consumption, but which still lack standardization and scale. Sidewalk also sees an opportunity to realize Waterfront Toronto's target of 10 percent onsite power generation using roof and façade photovoltaics, as well as battery storage. Between these efforts, Sidewalk expects to reduce draw from the Toronto Hydro electric grid by 75 percent per capita versus existing conditions.

Sidewalk also sees the opportunity to improve upon the MGBR in waste and water. In Quayside, Sidewalk will deploy a digitally enabled smart chute system that will help pay-as-you-throw waste regimes succeed in multifamily buildings by making it possible to differentiate between recyclables and trash. Sidewalk will also handle organic waste through a separate system culminating in an onsite anaerobic digester. Such a system will require minimal additional effort from users but will achieve vastly better outcomes—at a minimum, a 90 percent landfill diversion in household waste. Similarly, Sidewalk will go beyond the MGBR and use nonpotable water indoors as well as outdoors, through a complete purple-pipe system, so residents and workers become familiar with the idea of not using drinking water for all domestic purposes.


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## Realizing a Climate-Positive Vision

**The GHG reductions from Sidewalk's sustainability strategy have the potential to make Quayside a nearly climate-neutral neighbourhood and to realize Waterfront Toronto's climate-positive ambition on the Eastern Waterfront. For the full methodology of this analysis, see Appendix A.**




A2-b

## APPROACH TO DISTRICT-LEVEL SOLUTIONS

Sidewalk will seek to make use of the density that Waterfront Toronto hopes to achieve in both Quayside and the Eastern Waterfront to create a set of solutions that are flexible and shared. Many of these systems can begin at the neighbourhood level in Quayside but demonstrate their full potential when applied at district scale across the Eastern Waterfront.

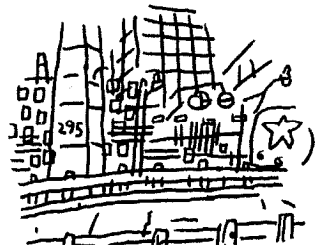
**Utility channels.** A key investment at district scale will be to create a system of utility channels to accommodate all networked utilities. These will provide space for electric wires, telecom conduits, and water and district heating pipes, as well as space for small-scale robots to travel between building basements and under walkable streets. The channels will enable the fast provision of new types of utilities as they emerge, and will make it easy to maintain systems without disruptive utility work. Finally, the robot lanes provide the network that will allow a new type of urban freight system to emerge, beginning with solid waste handling.

**Energy.** Despite the reductions in thermal load that Passive House buildings can provide, buildings will still need a high thermal load in Toronto's seasonal climate. To address this challenge, Sidewalk will seek to pilot in Quayside, and scale up across the Eastern Waterfront, a multi-source district heating and cooling system called the thermal grid. Unlike systems that only rely on a single source, the thermal grid will tap and export multiple sources of waste or free heat and cool in the area: geothermal, waste heat from sewers and the Portlands Energy Centre, deep lake cooling, and the capture and reuse of waste heat and cool from within the buildings themselves.

Capturing all of these sources will far exceed the thermal demands of the efficient buildings. As a result, the

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thermal grid will be the primary path for the Eastern Waterfront to realize its climate-positive ambition, according to Sidewalk's analysis (shown on the previous page). Further, there is so much excess heat that even if some sources were unavailable in the future, the system would still achieve climate-positive performance. Sidewalk will pilot a thermal grid in Quayside using waste heat from building and ground sources, but tapping the large sources of waste heat and Lake Ontario cooling will require the scale of the Eastern Waterfront to be economical.




**Waste and water.** Sidewalk sees a similar opportunity for district-scale solutions for both solid waste and water. While the Quayside Draft Vision Document has identified a vacuum system as a promising solution, Sidewalk sees even greater benefit in using industrial robots to move solid waste to a central point through utility channels. By putting waste into standardized containers that robots can move, neighbourhoods can adhere to the current three-bin approach (organics, recyclables, and landfill) while accommodating any change in the sorting regime. In Quayside, an anaerobic digester at the central point will consume the neighbourhood's organic waste, while landfill and recyclables will likely be shipped offsite. At the scale of the Eastern Waterfront, Sidewalk will seek an onsite material recovery facility for the remainder.

As mentioned, Sidewalk plans to incorporate a purple-pipe nonpotable water feed into each building's system. While Sidewalk will explore onsite rainwater capture and treatment for potable uses, the Ashbridges Bay Wastewater Treatment Plant could easily supply the entire Eastern Waterfront (including Quayside) with nonpotable water, which would greatly simplify the water supply system and eliminate large amounts of energy-consuming treatment equipment at the building scale.

**Telecommunications.** Digital communications are critical to the operation of a district. Connectivity will be ubiquitous in Quayside, consisting of high-speed wired communications over fibre and copper; high bandwidth wireless communications over Wi-Fi and cellular technologies; and long-range, low-bandwidth connectivity using low-power wide-area network technologies. The latter is especially appropriate for sensors in the public realm and within buildings as part of the outcome-based code, which will report environmental metrics such as temperature, carbon monoxide levels, noise, and vibration.

Incorporating these networks from the beginning, in such a way that they can be upgraded as new technologies emerge, will make sensing easier and cheaper to deploy on an unprecedented scale and density. Knowing that technology will keep improving over time, Quayside and the Eastern Waterfront will be designed to minimize the cost of hardware upgrades, and to avoid them as much as possible by enabling the infrastructure to be software-upgradable. In the same way that water and power are provided by a district-owned system, the provision of a district-level communications backbone and access points will reduce the expense and maintenance overhead of duplicate infrastructure from multiple providers.

A2.c
## BARRIERS /DEPENDENCIES




The two main types of barriers and dependencies to the full realization of Quayside's potential are economics and coordination.

**Economics and scale.** In many cases, the cost of implementing new innovations is hard to know, even if the benefits are relatively easy to predict. For example, the costs associated with implementing Passive House standards across a site the size of Quayside are not entirely clear. Similarly, while the costs of robots and other advanced technology systems are falling, the point at which costs fall far enough to enable the systems Sidewalk imagines is also not yet clear.

Most importantly, the overall scale of the development may prove a limiting factor. Some of the most impactful innovations are major capital projects that will require large volumes of reliable offtake to be financeable, including the thermal grid and the containerized waste system. Sidewalk may find that many of these concepts are feasible at the scale of the Eastern Waterfront but not of Quayside, and will work with Waterfront Toronto to discuss scaling back innovations in Quayside when the economics do not make sense, or finding innovative ways to expand the service areas of such projects whenever possible.

**Coordination.** Other dependencies relate to the coordination needed with other entities that control key aspects of the infrastructure that Sidewalk will plan to connect to or build upon, as well as the regulatory environment that will shape the site. For example, if the city determines that it is impossible to tap waste heat from the Ashbridges Bay Wastewater Treatment Plant, this decision will


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affect the expected performance of the planned thermal grid; however, Sidewalk's thermal energy plan identifies several sources so the loss of any one will not undermine the climate-positive objective. Similarly, Sidewalk will rely on Waterfront Toronto's delivery of its Intelligent Communities Initiative; should that project get delayed or altered, Sidewalk's concepts for connectivity will need to be amended.

In all cases, the best strategy is to start conversations early and recognize the perspectives and interests of potential partners. Sidewalk will work with these entities to develop approaches that meet their fundamental needs while also creating the flexibility necessary to innovate.

A2 d
### ECONOMIC AND TECHNICAL FEASIBILITY

Sidewalk has reviewed the Quayside Draft Vision Document in detail, and offers a specific assessment of each target and strategy in the Technical Appendix of **Appendix A**. Overall, the document establishes highly ambitious, though realistic, approaches that Sidewalk will be excited to implement. But Sidewalk's review identified several areas of focus consistent throughout the recommendations that may unnecessarily raise costs or difficulty, including an overemphasis on building-scale and single-purpose solutions, and an underemphasis on space constraints.

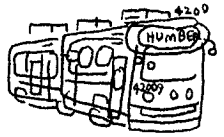
**A bias towards building-scale solutions.** In several areas, including potable water treatment, material recovery, waste-to-gas, and sewage heat capture, the Quayside Draft Vision Document specifies building-scale solutions as its objective. While digital technology enables many tools to be miniaturized, and building-level systems may be easier to replicate in other cities, the benefits of urban density are often best realized when economies of scale are leveraged.

**A focus on highly specific solutions.** Similarly, in several cases, the document identifies a specific technological solution when alternatives may prove better or have broader applications. For example, the document recommends a vacuum system for solid waste, as found in Roosevelt Island (New York City) and Hammarby Sjöstad (Stockholm). But that system has seen limited replication in its 35 years of operation because it is a dedicated, single-purpose system that must cover all of its costs based on waste-related savings alone. And while power-to-gas storage is a promising concept, it is not yet clear that such systems are better than traditional chemical batteries that may be more versatile.

**No focus on space constraints.** Many targets established in the Quayside Draft Vision Document involve commitments for the allocation of space, but the document does not explore how those allocations add up to compete with other desirable uses, including new residential and commercial space. For example, the goal of greater than 50 percent tree canopy and two acres of land for urban farming may prove difficult to reconcile with the goals for 10 percent onsite power generation, abundant open space for public activities, and affordable housing.

As Waterfront Toronto's innovation partner, Sidewalk will help address these challenges through several alternative strategies and tools. Sidewalk believes several solutions noted in the Quayside Draft Vision Document should be evaluated at a range of scales, such as wastewater heat recovery, which may work better at the neighbourhood scale than at the building scale. Sidewalk also believes different technologies should be evaluated when highly precise approaches have been specified; a robot-powered containerized waste system, for instance, could deliver the same benefits of a vacuum waste system while accommodating additional uses. And Sidewalk will identify an innovative approach to space constraints that still achieves important targets, such as obtaining the benefits of tree canopy coverage through a mix of other types of greenery, physical shading, and stormwater management.

In these cases and others, Sidewalk is eager to work with Waterfront Toronto and its team to evaluate the feasibility of potential solutions.




## Complete Communities

Sidewalk's vision of a complete community starts with a place that builds on Toronto's social, cultural, and economic diversity. It means a place that is inclusive, one that welcomes all comers to contribute to the fabric of urban life. It means a place that is adaptable, one in which buildings and spaces can change to address the evolving needs of the populations they serve. It means a place that is accessible in every dimension: welcoming, pedestrian-friendly, participatory, easy to get to, and easy to move around in. Most importantly, it means a place that is affordable.

A3 a
### MIXED-INCOME HOUSING

A complete community starts with housing affordability. Allocating a

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significant percentage of housing units as affordable is an integral part of any solution, but it falls short of a comprehensive strategy to deliver mixed-income housing. Sidewalk will tackle the challenge in multiple ways: using technology to lower building costs, designing buildings that can adapt to changing needs, and innovating on financing.

Quayside will pilot innovations that advance this strategy to achieve greater affordability across five different concepts. These efforts will enable Quayside to experiment with capabilities in the built environment that produce more useable, efficient, and affordable space, in a way that is replicable across Toronto and around the world.

**New construction methodologies.** There is enormous opportunity to drive down the cost of new construction by applying standardization and industrial approaches, such as assembling buildings from prefabricated components manufactured offsite, and employing standard and reusable product catalogues.

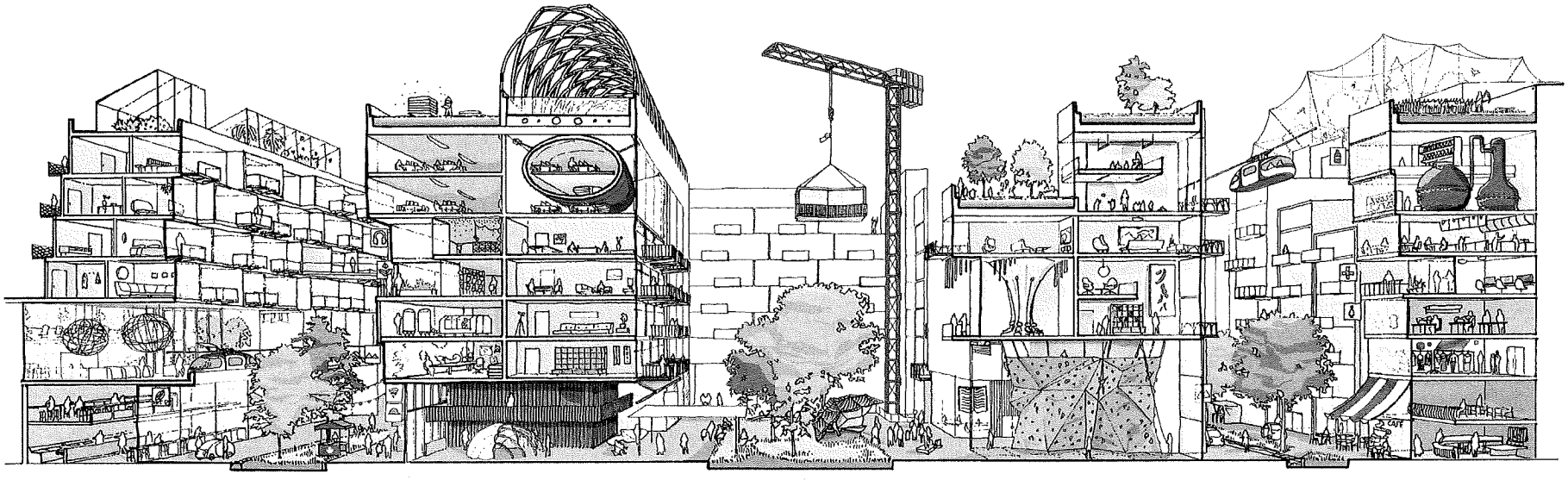
When these innovations are applied at scale, they enable the flexibility to deliver a remarkable range of customized structures and compelling architecture. These structures consist of a base set of modules that can be configured into different unit and building sizes, and finished with a variety of façade types—fully responsive to unique site conditions and needs. This approach will decrease construction, maintenance, and renovation costs, as well as expedite delivery timelines, all while maintaining high standards of urban design.

Specifically, Sidewalk proposes dedicated parcels in Quayside for both modular and tall timber construction. These building pilots will lay the groundwork for greater adoption in the Eastern Waterfront.

**New building typologies.** Sidewalk will also prototype building typologies in Quayside that demonstrate new levels of adaptability in the built environment.

The first is a concept Sidewalk is developing called Loft (conceptualized below). In many cities, structures built for manufacturing epitomize urban rejuvenation because they have proven adept at accommodating a wide variety of changing uses. The Loft

## A Flexible Loft for the Future City



The Loft structure is designed with a strong skeleton and a flexible interior to accommodate changing building and market needs, enabling radical mixed-use development to occur more quickly and at lower cost than it does today.

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concept improves upon traditional loft buildings by planning explicitly for ongoing and frequent interior changes around a strong skeletal structure. Its structure will remain flexible over the course of its lifecycle, accommodating a radical mix of uses (such as residential, retail, making, office, hospitality, and parking) that can respond quickly to market demand. This flexibility will reduce transactional costs, enabling the built environment to grow and evolve with the community.

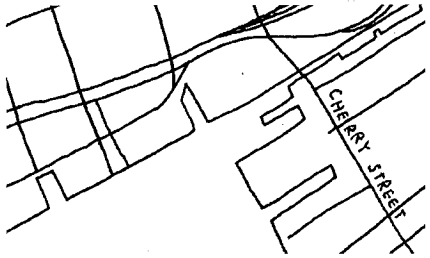
Specifically, Sidewalk proposes to hold an international design competition around Loft in Quayside. In its Quayside iteration, a Loft pilot could contain parking space that transitions to other uses once shared mobility reduces private car use.

**New regulatory frameworks.** New building typologies require an innovative approach to the building codes and zoning ordinances that govern the built environment. In the first half of the 20th century, prescriptive measures were necessary to protect human health, ensure safe buildings, and manage negative externalities. Today, cities can achieve those same goals without the inefficiency that comes with inflexible zoning and static building codes.

New predictive modelling techniques and real-time monitoring can enable a shift to an outcome-based building code. The outcome-based system will require buildings in an area (regardless of use) to conform to a series of safety and quality-of-place metrics that will be measured in real-time: structural integrity, daylight access, air quality, noise levels, energy usage, and more. This system will reward good performance and incentivize sustainable infrastructure, enable buildings to adapt their uses to market demand (including housing), and reflect the increased value of a truly mixed-use neighbourhood—one that is activated with varying uses throughout the day and can support a complete community.

Specifically, Sidewalk proposes to outfit buildings in Quayside with the sensors necessary to measure the data needed to craft the outcome-based code system before implementing it in the Eastern Waterfront. To ensure safety, Sidewalk will work with municipal and provincial agencies to design informative pilots within existing regulatory frameworks.

**New occupancy models.** A recent shift towards innovative commercial and residential occupancy models offers new formats, flexibilities, and opportunities for sharing. Start-ups have created co-working spaces and are exploring co-housing models, in which residents self-organize to share a greater proportion of amenities to reduce cost and enhance community. Sidewalk imagines these spaces to be a microcosm of a complete community: multigenerational, mixed-income, and diverse. Quayside can serve as the testbed for innovations that can accelerate this shift and broaden the appeal of alternative occupancy models.




**New financing models.** The Sidewalk team has a long history of developing innovative approaches to housing affordability. Several members played key roles in the development and implementation of New York City's New Housing Marketplace Plan, which created and preserved more than 165,000 affordable housing units. Some of its most effective components included dedicated revenue streams (the NYC Housing Trust Fund) and an expanded Housing Development Corporation (the city's housing bank) to dramatically increase housing options. The plan also implemented New York City's first exploration of inclusionary housing.

To achieve 20- to 30-percent affordability across the site will require new forms of public-private partnership. The levers available for delivering affordability will vary based on the full range of housing typologies (social housing, private rentals, subsidized rentals, home ownership) and the tenures of residents occupying them. A partial homeownership program might be a perfect fit for a family looking to settle down, whereas a retiree on a fixed income may require a rental subsidy. Sidewalk proposes to make Quayside a living laboratory for housing policy innovation that delivers a mixed-occupancy community that mirrors Toronto's socioeconomic diversity.

A3 b
## SUSTAINABLE TRANSIT

A sustainable transit strategy for the Eastern Waterfront must compete with private vehicles even at a site with excellent highway access and nearby parking options. To realize this objective, Sidewalk will deploy private car restrictions, traditional transit, and digital mobility tools to provide the most effective choices at lower cost for trips in and around Quayside, and usher in a new era of urban mobility in the Eastern Waterfront anchored around shared, electric, self-driving transit.

**Mobility within Quayside.** Sidewalk's vision for mobility within Quayside begins with dedicating a large

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portion of the site as a pedestrian area barring conventional (non-emergency) vehicles. On Queen's Quay and Cherry Street, which must carry regular traffic, Sidewalk will pilot a new type of adaptive traffic light that can hold signals to prioritize safety for cyclists and pedestrians. Sidewalk will work to include an abundance of Bike Share Toronto stations in the area. Finally, Sidewalk will encourage a diverse mix of retailers in Quayside to help people meet all daily needs by foot. These initiatives will create an extremely walkable neighbourhood where most trips are made by walking or cycling.

To encourage the most use of public space for the greatest number of days, Sidewalk will pilot new approaches to weather mitigation and asset management in Quayside. Bad weather affects pedestrians and cyclists more than drivers, pulling Torontonians off the streets and into the underground PATH system, or nudging them into cars. To encourage walking and cycling trips in all weather conditions, Sidewalk will test retractable canopies over walkways, and a heated pavement system beneath sidewalks and bike paths to melt snow. Sidewalk's analysis suggests that managing wind, sun, and precipitation can double the number of daylight hours when it is comfortable to be outside (see inset graphic).

Sidewalk will also build tools to ensure that the public realm is attractive and inviting. In Quayside, Sidewalk will pilot a system that tracks usage patterns and asset conditions through sensors, without tracking individuals. This system enables site managers to understand pedestrian and cycling flows, locate bottlenecks, and proactively identify repair needs. To demonstrate this capability, Sidewalk will pilot flexible space allocations using embedded LED lights, enabling a temporary bike lane to become a pedestrian laneway on demand, for instance.

**Links to the city.** For trips between Quayside and downtown, Sidewalk wants to implement the city's concept of "The Stitch"—improving waterfront connectivity via sidewalks and bike lanes. Incremental changes can make the Parliament and Cherry Street underpasses more attractive, but Sidewalk also envisions a significant investment to create a visible, attractive, and iconic link to the waterfront.

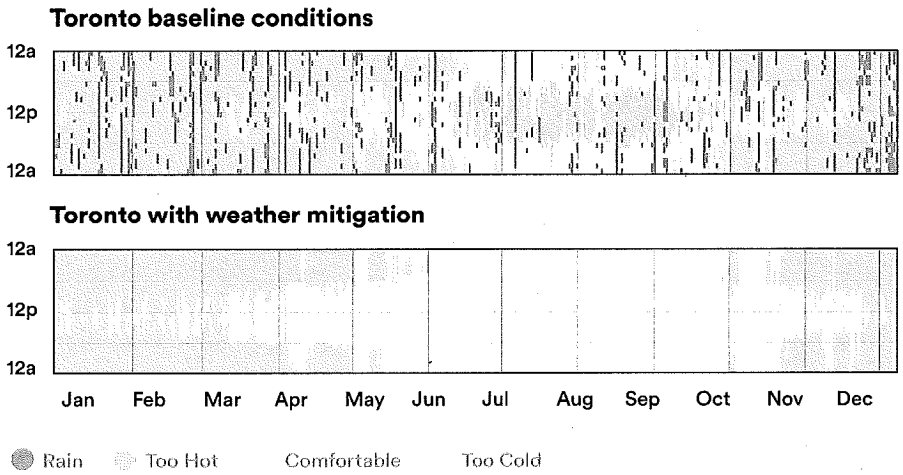
The most effective approach to serving trips into downtown will be to extend the 501 and 514 streetcar routes, an idea that Sidewalk will seek to explore in collaboration with the Toronto Transit Commission. This upgrade will provide frequent and fast service to King Street and along Queen's Quay, linking Quayside to Union Station. Sidewalk will also work with TTC to extend the Route 65 bus to serve Quayside, providing a direct connection to the Bloor-Danforth line.

For trips outside Quayside that cannot be made conveniently by walking, cycling, or transit, Sidewalk envisions concepts that will mitigate the negative impacts of car trips. Shared-ride taxi services can provide quality service while encouraging high vehicle occupancy. Electric shared vehicles (using the Zipcar or Car2Go models) can facilitate car trips while reducing auto ownership. For visitors who have no good driving alternative, Sidewalk is developing parking technology to make fast curbside drop-offs and pick-ups easy. In all cases, adaptive traffic lights will use sensors to detect pedestrians and cyclists and ensure they get priority at the intersection.

Critical to these strategies is ensuring that people have easy access to all of their mobility options, a concept known as mobility-as-a-service. Sidewalk plans to incorporate all Quayside-specific services into an API that can surface these options in a variety of navigation apps, such as Google Maps and Transit App.

Through these efforts, Sidewalk expects Quayside to achieve a world-class level of car-free urban mobility, with ownership rates of less than 20

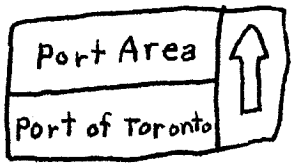
## Weather Mitigation: Doubling Outdoor Hours




These grids show outdoor comfort conditions every hour of every day over an average year in Toronto. Sidewalk's approach to weather mitigation can create an additional 2,767 total comfortable outdoor hours a year for the waterfront—doubling the current amount—by reducing the impact of wind, increasing shade on sunny days, and blocking rain.

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percent among Quayside residents—lower than most of downtown Toronto. That rate will save families thousands of dollars a year, reduce the neighbourhood's carbon footprint, and cut the number of necessary parking spaces in half, opening more space for the critical elements of a complete community: affordable housing, the public realm, and local amenities.




**The future of urban mobility.** The most exciting part of Sidewalk's mobility strategy for Quayside is that it serves as a testing ground for advanced deployment in the Eastern Waterfront, which offers the space and scale to reinvent urban mobility using the most revolutionary technology development in transportation since the jet engine: the self-driving vehicle.

Sidewalk believes self-driving vehicles will feel and function more like transit than like the private automobile. A shared-ride taxibot network can offer the advantages of point-to-point service with space and fuel economies approaching that of the city bus, replacing private cars while supporting transit enhancements such as further streetcar extensions, the planned new Metrolinx station at East Harbour, potential ferry connections, and the Relief Line. Such a system will benefit the public realm dramatically: on a street where all vehicles yield the right of way to people, pedestrian safety comes first.

Sidewalk will explore partnerships, including with its sibling company Waymo, to test multiple types of self-driving vehicles on the Eastern Waterfront. These could include a small van of six-to-twelve seats, which would be appropriate for low-density transit routes. Another option is a personal vehicle more like a bike than a car in size. In the near term, Sidewalk also sees the opportunity to use these vehicles to serve the public during the summer months as a shuttle between the Cherry Beach and the Distillery District, filling a transportation need while introducing Torontonians to this technology. Some single-person self-driving vehicles might eventually be integrated into an elevated transport system, such as a gondola. Of course, all tests of self-driving technology will require close coordination with Ontario policymakers and regulators.

Sidewalk also envisions a new urban traffic system for the Eastern Waterfront called the Ground Traffic Control System. Building on the adaptive traffic signals and parking technology tested in Quayside, as well as onboard navigation in self-driving vehicles, GTCS will optimize routes to balance individual and system efficiency, dramatically enhancing the performance of urban streets.

**Freight transit.** Sidewalk's approach to urban freight also involves self-driving technology. In Quayside, Sidewalk will pilot an internal robot delivery system via its utility channels. Robotic delivery is in its infancy and requires exploring trade-offs in terms of cost, delivery time, and convenience. Sidewalk envisions offering an internal delivery system to all businesses and residents in Quayside, and will seek to expand a successful system to the entire Eastern Waterfront.

A3-c

## RETAIL, CULTURAL, AND COMMUNITY AMENITIES

Developers have traditionally treated retail, cultural, and community amenities as a matter of simple curation, but the digital transformation of these areas enables a different approach to their delivery. Online sales have upended brick-and-mortar retail; artists are experimenting across media and collaborating across disciplines; more and more public services are being driven by data. Food trucks notwithstanding, ideas for providing these amenities are stuck on the standard 10-year retail lease, the purpose-built concert hall, and the static clinic.

In Quayside, Sidewalk will work closely with Waterfront Toronto and local partners to enable a dynamic range of local, independent, and diverse amenities to activate the public realm, support residents and workers, attract visitors, and contribute to high-quality placemaking. Key to Sidewalk's approach is to provide radical flexibility at much lower cost, attracting the most innovative amenity concepts from across Toronto and North America. Critically, it will lower the barrier for new entrants and enable the community gathering places that have become increasingly important in the digital age.

**The flexible built environment.** Retail is fundamentally changing, with on-demand delivery requiring smaller, more specialized stores and flexible stock. One concept Sidewalk will seek to develop in Quayside is the idea of the highly flexible storefront. Sidewalk's flexible Loft concept will enable retail spaces to expand or collapse quickly, and at low costs, as the population grows and retail trends change. Loft also enables interior spaces to be reconfigured to meet retailer needs and market demands.

Sidewalk seeks to make Quayside the desired location of innovative retail concepts merging the physical shopping experience with the digital, such as Amazon Go, a brick-and-mortar supermarket that automatically

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bills shoppers for their cart contents without the need for a checkout line. Sidewalk is also exploring the concept of a "next-gen bazaar"—a flexible makerspace filled with dozens of easily removable stalls that can house a dynamic range of retail and cultural activities. Flexible space can also support new approaches to community services such as health and education, from urgent-care clinics that pop-up during a flu outbreak to temporary classrooms that can relieve pressure on school buildings.




**The programmable public realm.** Cities thrive on public activity and dynamism. The most exciting ways to activate the public realm are often a mix of traditional uses in flexible spaces: the cafe that puts tables on the sidewalk, the teacher who uses a park for nature lessons, the artist who turns a street corner into a stage. Building on a robust system of asset monitoring, Sidewalk can make areas of the public realm reservable for a wide range of temporary uses without impinging on the public's overall needs. Sidewalk plans to design into the public realm a set of outdoor "rooms" that would be conducive to the needs of performers, craft sellers, and other innovators.

**The nimble cultural institute.** Visual and performing artists are increasingly working across disciplines, and presenters around the world need to look beyond traditional facilities to showcase work and build audiences. An auditorium may not be the right venue for an interactive performance, nor a gallery the right space for a multimedia exhibition. In New York City, a new institution, The Shed, is dedicated to the notion that technology enables new types of artistic collaboration and dynamic performances; its telescoping shell can expand or contract via rails to accommodate an ever-changing mix of performance, music, and visual art. That principle of radical flexibility can be extended across Quayside, allowing a permeability of temporary and permanent culture and public art anticipated to exceed the 30,000-square-foot arts and culture requirement outlined in the Quayside Draft Vision Document.

**Data-driven social services.** In addition to retail and cultural amenities, a complete community requires a robust set of local services, including schools and libraries, primary healthcare facilities, and child-care providers. In Quayside, the digital layer of Sidewalk's urban innovation platform can help these services become more flexible and responsive to individual needs. Sidewalk's Care Lab, for example, is exploring ways to integrate primary care and social services data to deliver more proactive healthcare to city residents. This delivery model can enhance Ontario's Community Hubs program, which brings together multiple services in one location; in Quayside, Sidewalk will work with local providers to build a digital social service tool that can enable more personalized care.

**Encouraging mutual assistance.** A flexible community is also one that makes it easy for neighbours to collaborate with each other, and for residents to communicate with local officials. In Quayside, Sidewalk will pilot a neighbourhood assistant tool to facilitate social cooperation and civic engagement. The tool will provide a one-stop access point for a variety of service requests—working toward the next generation of 311. Quayside residents will be able to use the neighbourhood assistant for maintenance or sanitation requests, for instance, or to report an issue with their local playground.

Through its close collaboration with Waterfront Toronto, Sidewalk will work to ensure that public feedback plays a core role in its approach to retail, cultural, and community amenities in Quayside.

# Economic Development and Prosperity

A4 a
## JOB CREATION CAPACITY

A cluster is a geographic concentration of companies, institutions, and entrepreneurs working in a specific field. Successful clusters increase productivity, give rise to new businesses, and accelerate innovation through a density of talent, the ability to recruit newcomers, and heightened competition. Initial job anchors can ignite a cluster, with an inner ring of professional jobs drawn to strong talent, and an outer ring of indirect jobs and multipliers serving the ecosystem. Silicon Valley is a perfect example: the combination of Stanford research and military funding catalyzed what is now the world's foremost digital technology cluster.

Toronto has all the raw materials necessary to spark an urban innovation hub, including a diverse community, an openness to global talent, and an attractive lifestyle. It is home to a highly educated workforce surrounded by great institutes of higher learning. There is a burgeoning tech presence, boosted by proximity to the software industry in Kitchener-Waterloo. And

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there is a motivated public sector with an active interest in innovation. The new Vector Institute for artificial intelligence, to which Alphabet has committed 5 million CAD, is a microcosm of what happens when all these threads start to weave a new cluster.

To catalyze a cluster around the urban innovation platform in Quayside, Sidewalk will provide an initial anchor through a commitment from Alphabet to move Google's Canadian headquarters to the Eastern Waterfront. Google's presence will lend the neighbourhood commercial and innovation credibility. In other locations, Google has created a multiplier impact, generating additional job growth or relocation.

As a secondary anchor, Sidewalk will work with local institutions such as the University of Toronto and Ryerson University to establish an urban innovation institute, bringing together academia, industry, government, and entrepreneurs to address the growth challenges facing cities. This applied research institute can create a talent pipeline and a real-time knowledge-exchange with pioneering companies, just as Stanford does with digital startups in Silicon Valley, and Cornell Tech does with engineers in New York.

As new questions, problems, barriers, and opportunities emerge daily in the living laboratory of Quayside, the institute will provide a collaborative arena to explore, innovate, test, and create new products and technologies. Cleantech firms developing building controls can work with behavioural scientists to understand habit formation. Hardware startups developing self-driving vehicle sensors can work with crowd researchers to predict movement patterns on busy streets. As urban innovations succeed, other cities will implement the technologies incubated in Quayside, creating a positive feedback loop that draws in yet more entrepreneurs, and turning the institute into a global hub for the study of urban life.

To further catalyze a cluster around these anchors, Sidewalk will seek to foster a collaborative environment for startups and other young companies (discussed more in **A4-c**). Sidewalk expects the platform's fundamental conditions to be attractive to all types of digital-economy companies, with particularly high levels of interest from Toronto-based startups exploring cleantech and building materials innovations, and Kitchener-Waterloo ventures focusing on robot manufacturing and artificial intelligence.

The breadth of disciplines and business types that emerge in Quayside will reflect just how many fields touch on urban life. Take mobility as one area of focus. A car manufacturer might want to locate a research-and-development facility for self-driving vehicles in the area to be close to test sites. A ride-sharing company may choose to pilot new services. But the cluster will extend beyond core mobility products. New companies in areas like financial services, operations, infrastructure, technology, and energy will gather or emerge to provide related services. Insurance companies might use the data-rich environment to explore new underwriting models. Cleantech companies might deploy new types of charging stations for self-driving electric vehicles.



Placemaking and planning in Quayside itself will also drive the innovation cluster. The same neighbourhood qualities that will make Quayside so compelling to future residents will make it attractive to best-in-class employers and knowledge-economy workers: an active public realm, an ever-changing mix of retail and cultural amenities, a robust walking and cycling infrastructure, and a culture of innovation. This growing economic activity will create additional jobs necessary to support the population, including service jobs.

Part of growing an inclusive urban innovation cluster means making sure that the opportunities it creates are accessible to all Torontonians. To build upon Toronto's existing talent base, Sidewalk will partner with large tech employers and local institutions to establish an advanced skills training program—a target identified in the recent federal budget—where workers can develop high-demand skillsets for the digital economy. Sidewalk will work with the Waterfront Toronto Employment Initiative to identify talent from the surrounding neighbourhoods for technology training programs, as well as broader employment opportunities created by the cluster. And by offering programs geared toward school children, the training effort can inspire the next generation of technology entrepreneurs in addition to training today's workforce.

At its peak, Quayside can become the anchor of Toronto's innovation ecosystem. But once this living laboratory expands to the scale of the Eastern Waterfront, Toronto will become the urban innovation anchor for the world, generating new economic activity from unexpected places. The film industry in Toronto shows how public-sector vision can catalyze a cluster, producing direct jobs (such as film crews and special effects artists) and indirect jobs (such as carpenters and caterers). That example offers only a glimpse of what is possible in an urban innovation cluster that cuts across many, many more disciplines. In time, the Eastern Waterfront will become a fully diversified economic engine—capable

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of driving Canada into a new frontier of growth in the 21st-century economy.

Sidewalk estimates that, at full build, the Quayside neighborhood will house more than 5,500 jobs and generate more than 50 million CAD of annual property taxes. And depending on the scope of the development program agreed upon by Sidewalk and Waterfront Toronto for the Eastern Waterfront, its impact on jobs and tax generation when fully built could be ten times that of Quayside.

A4 b
## PROSPERITY

Waterfront Toronto and Sidewalk share ambitions of turning the Eastern Waterfront into the most innovative urban district in the world. But if these innovations do not lead to substantial quality-of-life improvements for residents, workers, and visitors, the endeavour will have failed.

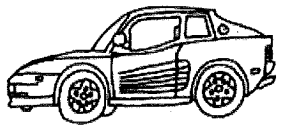
Of course, it is hard to know how urban innovations will impact quality of life in a real-world environment, since no place in the world truly integrates cutting-edge urban design with state-of-the-art technology. To explore how its urban innovation platform and concepts would perform in different settings, Sidewalk conducted rigorous feasibility studies on three American locations, representing distinct urban archetypes, including a Tier 1 city with conditions reasonably comparable to Toronto. For each location, Sidewalk examined platform conditions and launch concepts similar to those proposed in **A1-c** on a site comparable in size to the Eastern Waterfront. Using these feasibility studies, Sidewalk developed detailed projections on a comprehensive set of quality-of-life measures, including cost of living, job growth, carbon emissions, walkability, green space, and commute time savings. In all three study locations, Sidewalk's urban innovation platform enabled a significant improvement on quality of life compared with the surrounding metropolitan area.

Based on those feasibility studies, Sidewalk expects to see incremental improvements on quality of life during the Quayside neighbourhood pilot, and transformative gains across every dimension when coordinated solutions are deployed at scale across the Eastern Waterfront.

**Cost of living.** In the feasibility study of a district-scale site comparable to the Eastern Waterfront, Sidewalk projected a 14 percent cost of living reduction for a family of four compared with the surrounding metro area, a savings of more than 17,700 USD per year. These savings came primarily through lower rents (more efficient buildings allow residents to live just as comfortably with less space), lower transportation costs (walkable urban design, radical mixed-use, and shared mobility reduce the need for car-ownership), lower-cost utilities (pay-per-usage systems incentivize lower consumption while decreasing cost), and lower general cost of living. Based on its feasibility studies, Sidewalk expects Torontonians to reduce cost of living by 10 percent or more in a revitalized Eastern Waterfront, with a large share of savings coming from the 1,400 CAD per month families spend on transportation.

**Environment and climate.** In its district-scale feasibility study, Sidewalk projected a 73 percent reduction in greenhouse gas emissions per capita compared to the surrounding metro area. In Toronto, deploying similar innovations, Sidewalk believes it is feasible for Quayside to approach carbon-neutrality, and for the Eastern Waterfront to realize Waterfront Toronto's climate-positive goal. The greatest reductions stem from energy efficiency and the flexible thermal grid; with these savings, Quayside buildings can be virtually carbon-neutral, reflecting a 95 percent reduction in greenhouse gas emissions, even against Waterfront Toronto's aggressive MGBR baseline. Beyond greenhouse gases, Sidewalk expects to achieve significant reductions in other environmental impacts, including a 65 percent reduction in the consumption of potable water and a 90 percent reduction in landfill waste generation, relative to Toronto's current measures. The scale of the Eastern Waterfront makes it possible to incorporate massive sources of heat and cool into the system, exporting significant thermal energy to the rest of the city and achieving climate-positive performance.

**Convenience and transport.** In Sidewalk's feasibility study of large-scale innovation sites, the combination of radical mixed-use (bringing jobs closer to homes) and a public realm conducive to walking and biking encouraged far more active transportation and decreased the amount of time spent in daily travel. The study projected that residents would be 10 times more likely to take walking trips in a district comparable to the Eastern Waterfront than in the surrounding city, and would save one full hour on daily travel, primarily through shorter commutes. On the Eastern Waterfront, Sidewalk estimates a substantial increase from the 10 percent of trips taken by foot or bike in Toronto today, and a sizeable reduction in the city's 66-minute average daily commute.




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**Green space.** In large-scale sites comparable to the Eastern Waterfront, Sidewalk's urban innovation platform led to the projected creation of two to five times more green space than in surrounding metropolitan areas, primarily because on-demand, self-driving mobility enables a community to repurpose land once used for roads and parking as green space. Similar achievements in the Eastern Waterfront would put all residents within a five-minute walk of a park. Sidewalk believes the Eastern Waterfront can aspire toward the 51 percent green space coverage found in one feasibility study site—though even half that would represent a significant improvement over the 13 percent of land currently dedicated to green space in greater Toronto.

**Business opportunity.** In a large-scale site comparable to Toronto's Eastern Waterfront, Sidewalk's urban innovation platform drove a projected 10 percent bump in labour force participation and doubled the number of freelancers, primarily through a greater prevalence of non-traditional, flexible working arrangements. From a business perspective, flexible building design and modular construction methodologies reduced barriers to entering a market, with 12.5 percent savings on commercial fit-out costs. In Toronto, the urban innovation platform will create the conditions for an innovation marketplace that attracts an increasing share of Toronto residents and entrepreneurs. Ubiquitous connectivity across the waterfront will improve digital inclusivity, and a commitment to training residents for the tech jobs of tomorrow provides more access to opportunities.



LOAF OF PUMPERNICKLE RYE BREAD AT FUTURE BAKERY IN ST. LAWRENCE MARKET

**Health.** In Sidewalk's feasibility studies, the proposed built environment integrated health and well-being into everyday life. Sidewalk achieved a projected 100 Walkability score, enabled largely by radical mixed-use, creating a public realm conducive to active transportation. Walking, cycling, and shared electric vehicles cut harmful transportation emissions by a projected 67 percent compared with the surrounding metro area. Advances in telehealth and the expansion of hyper-local pop-up clinics made access to healthcare more convenient. The combined effect was a more active, healthy pool of residents, resulting in improved outcomes and lower costs for the system. Sidewalk expects similar targets to be achievable on the Eastern Waterfront, putting its goal of becoming a WELL-certified community within reach.

**Civic engagement.** Sidewalk's feasibility study estimated that residents in a large-scale district comparable to the Eastern Waterfront would show increased rates of volunteering and neighbourhood engagement compared with the surrounding metro area. These increases were rooted in the neighbourhood's more convenient mobility systems, its more flexible public spaces (decreasing barriers to finding volunteer opportunities), and a neighbourhood assistant tool to facilitate community interactions. When similar initiatives are implemented along the waterfront, Sidewalk expects to meaningfully increase volunteer rates over the Toronto average.

A4 c

## SUPPORT FOR INNOVATION

Toronto is home to thousands of tech startups, many of which will be eager to seize upon the opportunities in Quayside created by the urban innovation platform. Sidewalk's approach to engaging early-stage companies centres around keeping the platform as open as possible to encourage the most creation and collaboration with the fewest barriers to entry.

**Open principles.** As the first urban neighbourhood in the world to integrate digital and physical infrastructure, the Quayside development will make it easy for early-stage companies to experiment with new concepts that can address urban growth challenges. The platform's digital layer, which collects data on the urban environment via sensors, will be governed by open standards, providing well-designed, well-documented, and well-supported APIs to third-party developers. Platform components and applications will be published under open-source licences where doing so results in significant additional value to the ecosystem as a whole. The platform's flexible physical layer will be an asset, too, given how hard it can be to test innovations that involve utilities or the built environment in traditional cities. The establishment of strong job anchors such as Google will further entice entrepreneurs, providing employment options to fall back on if a venture fails, as many inevitably do.

**Early-stage support.** In addition to establishing the urban innovation platform, Sidewalk has explored a series of approaches to attract entrepreneurs, early-stage companies, and complementary professionals and institutions. For instance, Sidewalk will explore ways for early-stage companies to deploy innovations to "alpha" communities of early adopters who opt in, leading to faster testing and iteration of new urban innovations. Sidewalk will also look to provide early-

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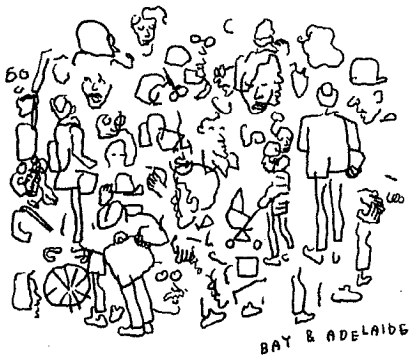
stage companies with makerspace to test new materials or manufacturing capabilities—perhaps through the urban innovation institute. Critically, these capabilities will give creators the ability to build, decorate, and furnish the neighbourhood, and to generate revenue along the way.

Additional programs will seek to increase the workspace options available to young companies. One approach might be to provide free or low-cost co-working space for qualified startups for a limited period, perhaps 12 to 24 months. Another might be to pursue live-work and mixed-use buildings that can further reduce rental (and commuting) cost for companies and their employees. A third possibility might involve collaborating with industry and service-provider partners critical to early-stage company formation, such as legal or accounting services, likely in partnership with the urban innovation institute.

**VC investments.** A key barrier to the success of early-stage companies in Toronto is access to leadership talent and growth capital. Sidewalk will create opportunities for marquee North American VCs (and their talent networks) to participate directly in the funding of innovations.

In Quayside, Sidewalk's team will scan the marketplace and engage relevant early-stage companies. An initial scan identified many Canadian companies with products and services relevant to Waterfront Toronto's goals for the Eastern Waterfront that may be worth early investment consideration. These include Toronto-based companies focused on sustainability innovations around energy-efficient lighting and energy storage. This list also includes several Kitchener-based companies exploring data-driven tools with relevance to the urban environment, including explorations around indoor mapping, robot manufacturing, traffic data, and health sensors.

As early-stage companies launch and scale in Quayside, they will complement the initial economic anchors and help jumpstart Toronto's urban innovation cluster.






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# Appendix

## A Neighbourhood from the Internet Up


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# 1. Introduction

Sidewalk Labs has included this appendix to share more detail on its close study of waterfront history, its approach toward digital and physical innovation in Quayside, and its theory on why these applications will transform urban life once deployed across the Eastern Waterfront.

Specifically, this appendix shows more of the work underpinning the innovation concepts and conclusions described in Section A1-c ("Purposeful Solutions"), including roadmaps to their further development in partnership with Waterfront Toronto.

This appendix also includes a Technical Appendix further responding to the prompt in Section A2-d requesting an economic and technical feasibility review of the Quayside Draft Vision Document ("Toward a Regenerative Waterfront").

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# Toronto: A Dynamic City Stepping Ahead

TO LIVE IN TORONTO TODAY IS TO EXPECT CHANGE. The city is in the midst of a transformation that is not only intensifying its urban centre but linking it to an entire region spanning the shores of Lake Ontario. As its neighbourhoods become denser and towers grow taller, Toronto is straining against its aging infrastructure and the traditionally sluggish pace of urban change.

But the conditions are right for Toronto to overcome these challenges and gain wide recognition as the great global hub that its heavily immigrant population already knows it to be. A metamorphosis is underway, and it is palpable throughout the city. New people with new talents are bringing new ideas. New energy is being channeled into change.

Any local will tell you that the next decade is pivotal. The best ending to this story is not Toronto becoming the next New York or San Francisco. It is Toronto becoming a better version of what it has always strived to be: a city that works—for everyone.

The pressures pushing against this ideal of inclusive growth are mounting, but so, too, is an appreciation for what makes the city special. People are rediscovering its waterfront and ravines—the twin topographies that shape the city. They are pushing for a pedestrian realm that encourages social cohesion and a transit system that does not require life with a car. They are celebrating the city's excellent public schools and libraries and institutes of higher education as a key driver of upward mobility. And they are clamoring for a city style that is dense and energized, mixed and messy, civil yet inspiring.

Toronto is a city of neighbourhoods, and if it hopes to meet its growth challenges—with several million people expected to join the metro area in the next 25 years—it will need new ones that meet these aspirations. That means turning to the Eastern Waterfront as the city's next great neighbourhood frontier.

New communities will need to emerge along the water. These communities will need to be forward-looking, incorporating the best traditional urban forms with the latest planning designs and digital technology. Fortunately these communities will not have to look far for inspiration. They can borrow from the street-level variety of Leslieville and Riverdale, the sustainability and vibrancy of the Canary District, the mixed-housing and public space of St. Lawrence Market.

The waterfront has all the assets to achieve its goals.

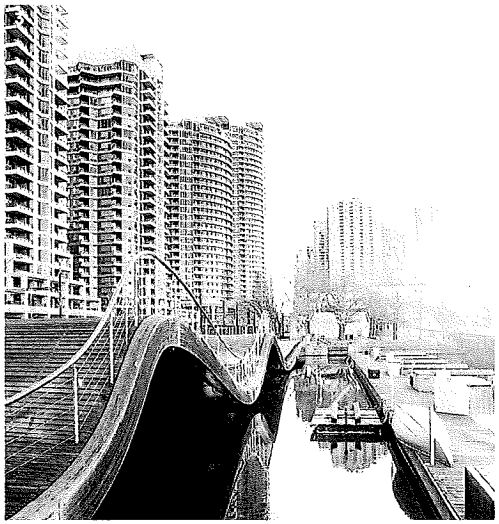
What it needs now is a jump start.



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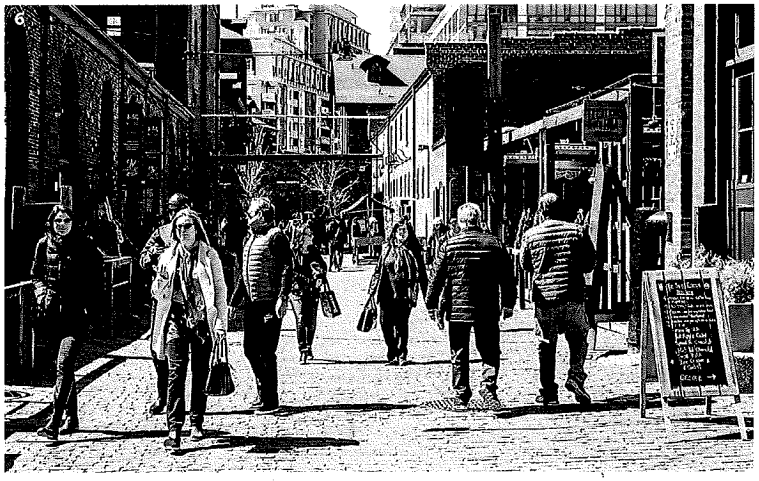










1. Harbourfront Centre meets Queens Quay West.
2. Air Canada Centre.
3. The Wavedecks at the foot of Simcoe Street.
4. Entice Culinary Lounge nestled in West Queen West.
5. Spadina Avenue, Chinatown.
6. Tank House Lane.

Credit: Mark Wickens

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# Sidewalk Labs: Where the Physical Place Meets a New Approach

SIDEWALK LABS WAS FORMED TO HELP FAST-GROWING CITIES meet the very challenges that Toronto is facing today. Its mission is to take the great principles of urban planning—the same ones Toronto has outlined in its growth plan for the core, such as affordability, inclusivity, and sustainability—and accelerate them into the digital age.

Over the past 200 years, the greatest leaps forward in urban life have occurred at the intersection of new technology and the physical environment. The steam engine, electricity, and the automobile all transformed how people live in cities today. These advances were not without their drawbacks, of course, but they fundamentally changed the capabilities of cities.

The world is on the cusp of a fourth revolution in urban technology every bit as powerful as the previous ones, driven by ubiquitous connectivity, machine learning, and new advances in design and digital fabrication. But as Toronto knows, cities do not have time to wait for transportation to become cleaner and more convenient, for housing prices to decline, for job opportunities to grow. The pace of urban change is too slow.

To overcome this challenge, Sidewalk started with a question: What could today's cities look like if they were built from scratch in the internet age? What emerged from this thought experiment was not a series of answers: there are no simple solutions to the problems of urban growth. Instead it is a new approach that sees cities as platforms for urban innovation that create the conditions for people to build, test, and refine new ideas that can improve quality of life.

Building new neighbourhoods from the internet up is a remarkable opportunity to embed emerging digital capabilities into core infrastructure from the start. Physical spaces like buildings, streets, and parks can be designed for the opportunities that technology present, rather than forced to retrofit new advances very slowly and at great cost. By merging the physical and the digital into a neighbourhood's foundation, people are empowered with the tools to adapt to future problems no one can anticipate.

Such a place quickly becomes a living laboratory for urban innovation. Given the speed of technological change, cities will only meet their growth challenges if they support innovation not right now but 10, 20, and 50 years ahead. To do so requires designing for radical flexibility, enabling the best ideas to be refined in real time and creating a cycle of ongoing improvement driven by the feedback of residents and the energy of entrepreneurs, rather than prescribed by planners and designers.

Of course, the objective is not to showcase technology for its own sake. Instead, it is to enable what is best about cities—direct human interaction—without imposing the barriers that prevent people from connecting and limit their access to the city's many resources. Technology can help create complete communities that are highly interactive and accessible to all, freeing residents from the constraints imposed by the heavy infrastructure and spatial hierarchies of the last century.

In that sense, Sidewalk's mission is not to create a city of the future at all. It is to create the future of cities.

**The Eastern Waterfront is the ideal location to demonstrate the power of forward-thinking urban design and technological innovation.**

Credit: Mark Wickens



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# 2.

# A New Kind of Neighbourhood

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A neighbourhood from the internet up combines the advantages of a global city with a close-knit community. It leverages innovation to achieve the benefits of urban density and vibrancy without the negative frictions that traditionally come with urban growth, from traffic congestion to housing costs to environmental impacts.

This new kind of neighbourhood will be a complete community: socially and economically diverse, radically mixed-use, empowered by technology and data to make things work better, and oriented around a pedestrian-centred public realm made possible by self-driving vehicles.

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# Innovation at the Physical and Digital Layers

AT THE HEART OF SIDEWALK'S APPROACH to building a neighbourhood from the internet up is viewing it as a platform that integrates the physical environment with digital technology, creating the core conditions for urban innovation.

Traditionally, the physical components of a city have been fixed into place from the start, constraining new development as they become outdated and costly to upgrade. A growing city must have built-in flexibility to support ongoing innovation, and the ability to adjust as technology, market cycles, and urban lifestyles move in new directions.

Sidewalk envisions a physical layer that is far more adaptable and open to change than what is found in cities today. The four key components to this layer—flexible buildings, people-first streets, an adaptable public realm, and open utility infrastructure—are explored in greater detail in this section.

Threaded through all these components is the platform's digital layer—a new and transformative element. Distributed throughout the neighbourhood via sensors and other connected technology, the digital layer provides an unprecedented degree of insight into the physical environment. And with heightened ability to measure the neighbourhood comes better ways to manage it.

This capacity to evolve in response to new thinking will help Toronto meet the unforeseen challenges of the future.

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**Digital Layer**

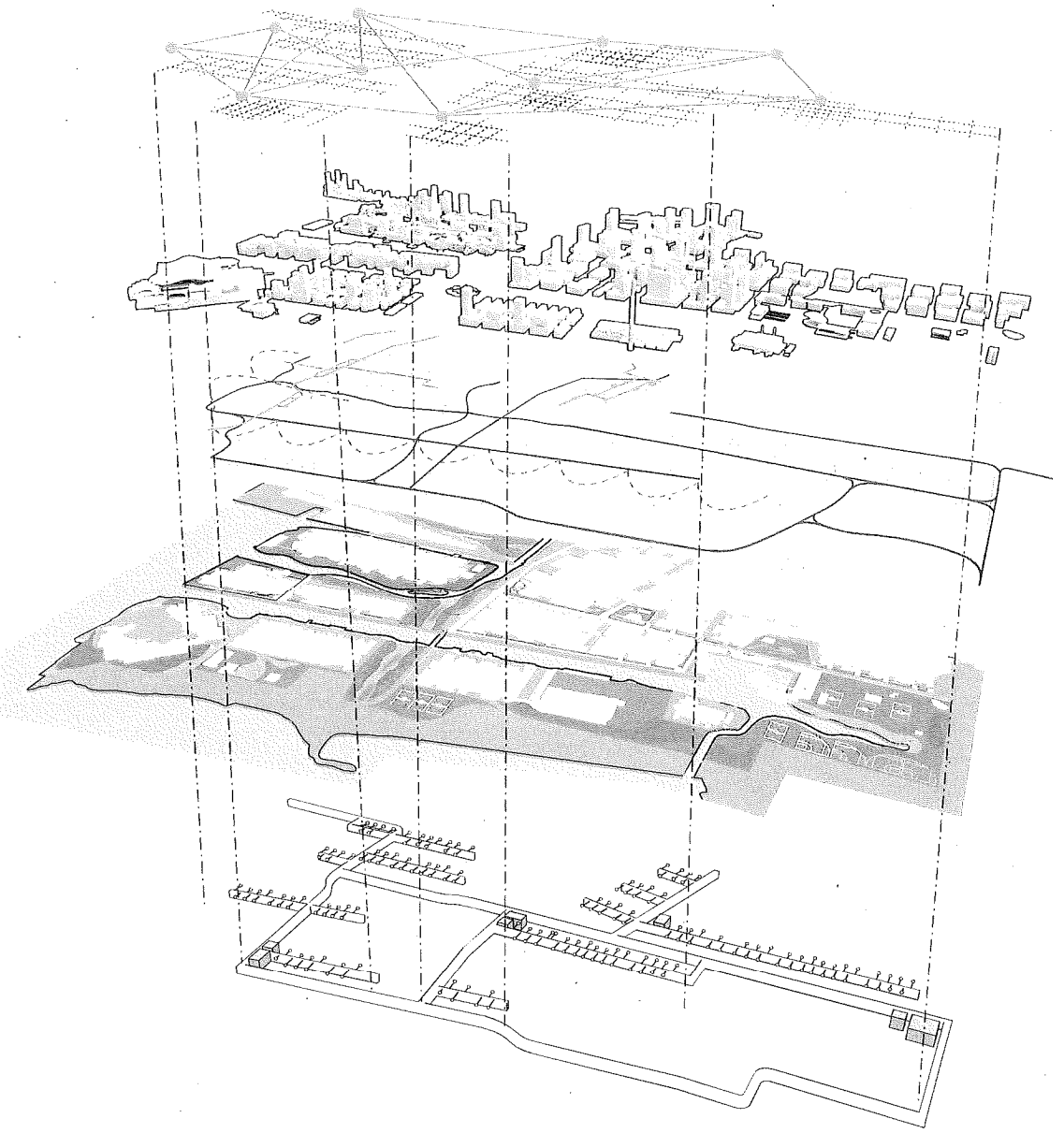
PHYSICAL LAYER

**Buildings**

**Mobility**

**Public Realm**

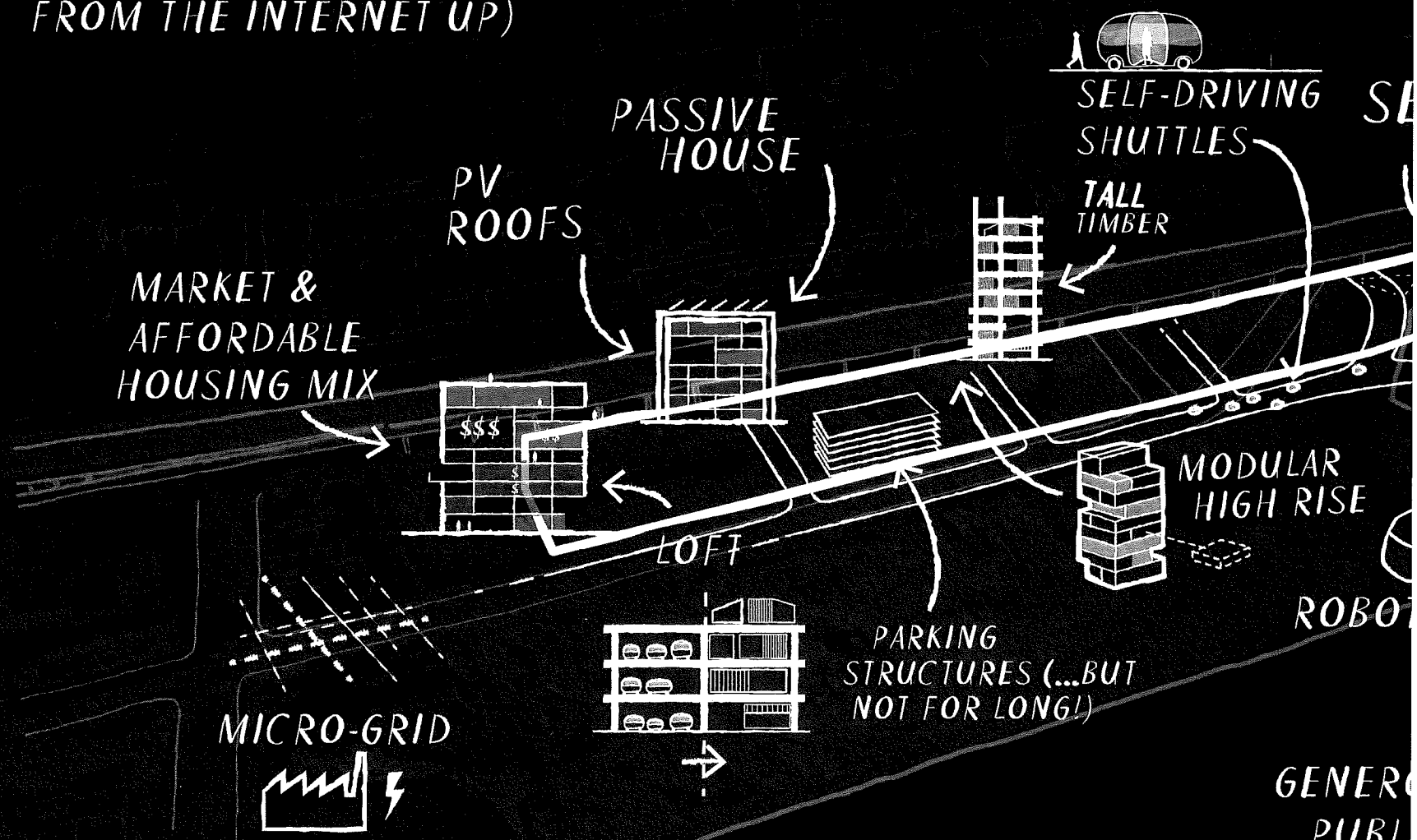
**Infrastructure**



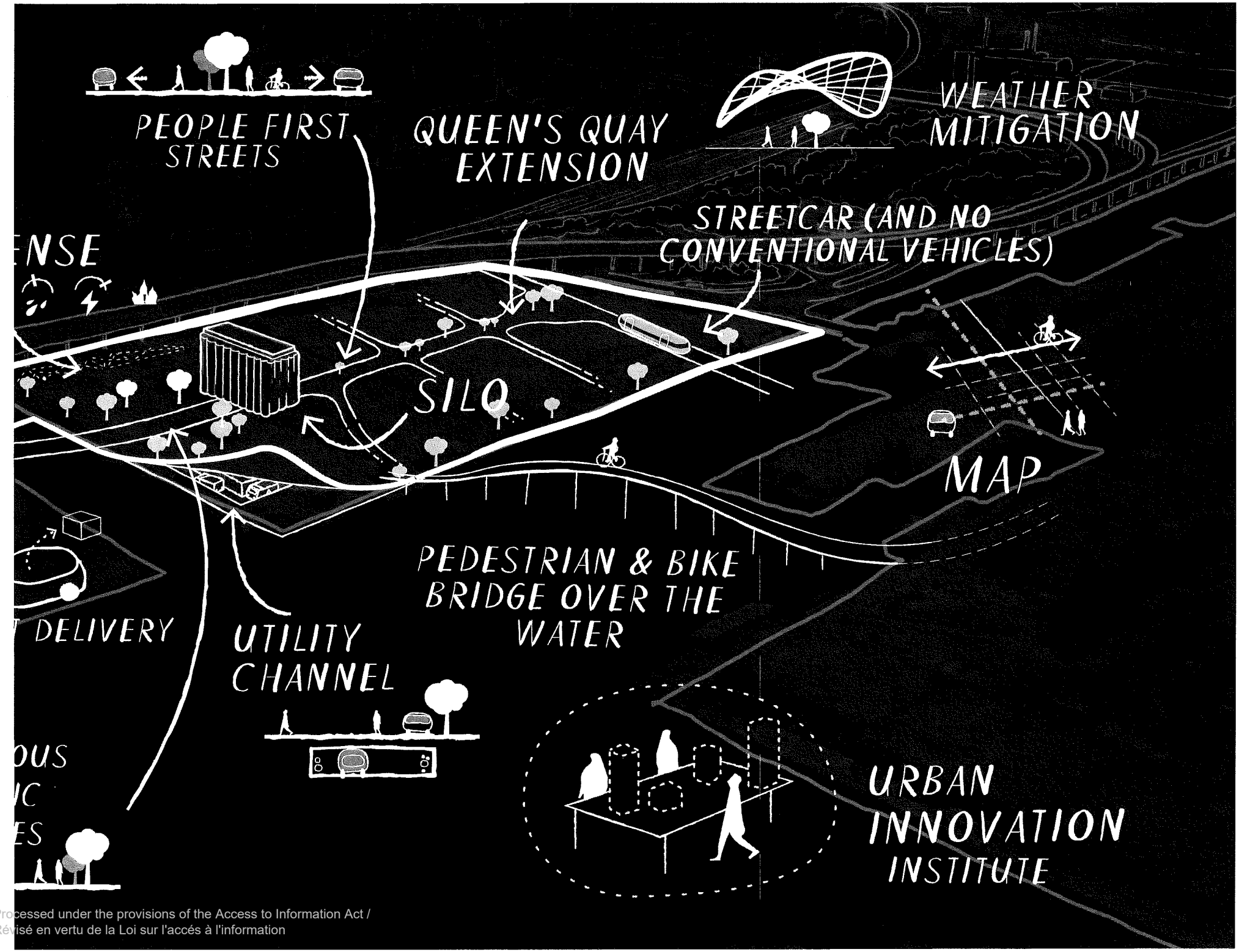
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# QUAYSIDE AS TESTBED

(THE FIRST NEIGHBOURHOOD FROM THE INTERNET UP)




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# What Makes This Neighbourhood Different? Streets That Put People First

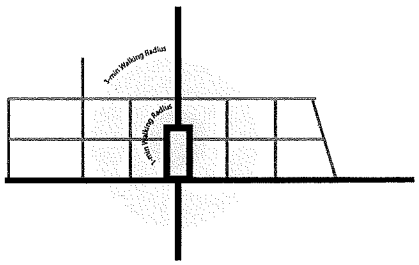
**STREETS ARE A NEIGHBOURHOOD'S MOST IMPORTANT SPACES.**

Roads shape the character and identity of any neighbourhood, but since the invention of the automobile, street networks have put cars first. Sidewalk believes in designing streets with people at the forefront, and self-driving mobility makes this paradigm shift possible.

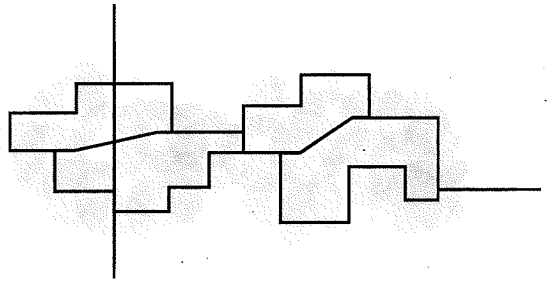
Self-driving vehicles can be accessed at any location, making it possible for the neighbourhood to have a non-hierarchical, decentralized form where many activities can happen in many places, untethered from the traditional central transit hub. In short, they turn every corner into a bus stop. Their operation also ensures a dramatic change in pedestrian safety, via collective efficiency and constant sensor-enabled monitoring of the environment.

At the same time, pedestrians and cyclists will have a freer, more accessible environment because the entire street system is no longer designed around controlling the behaviour of human-operated cars. Instead, land once used for parking and road separation can go toward greater space for biking and walking, and reducing the distances between destinations. Bike highways will connect across and between neighbourhoods, providing pleasant and scenic express routes that incorporate weather protection against rain and snow.

This new type of neighbourhood reimagines the historic walking city as a healthy and welcoming streetscape where self-driving vehicles navigate safely in a shared space with pedestrians. Each street type (explained at right) will reflect a human orientation in its scale and speed—large enough not to be crowded but small enough not to be alienating. Together, they can be arranged in a variety of ways to ensure that mobility remains convenient into, out of, and within the neighbourhood, while enhancing the public realm for everyone.




**Traditional Transit Oriented Development Mobility**

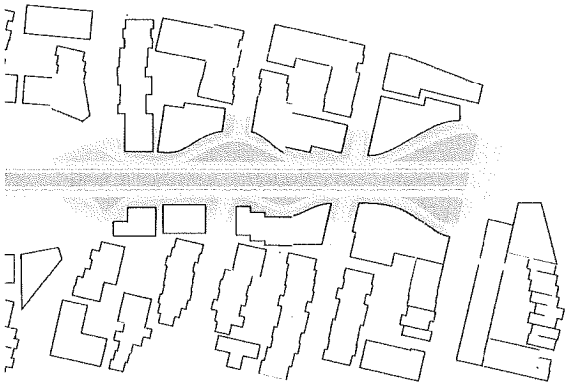


**New Neighbourhood Mobility**

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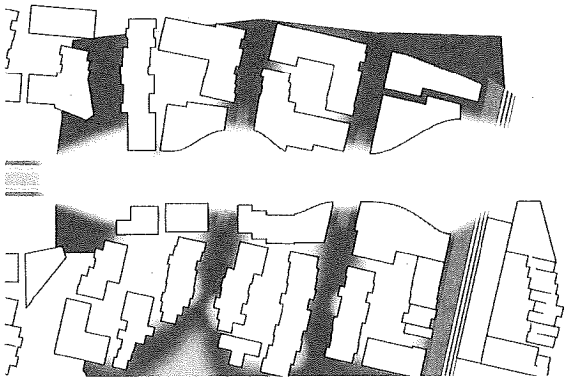
## Avenues

As the most grand of the neighbourhood's streets, avenues create easily traversable but active boundaries between areas. They are spaces of transition—from vehicle to foot, from building to outdoors.



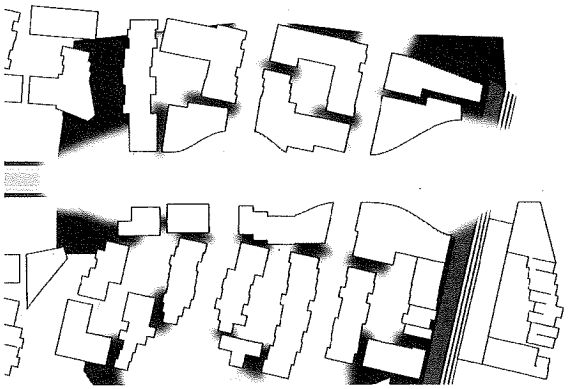
## Laneways

Laneways will be where the bulk of people spend their time, and their bustling mix of uses—mobility, commerce, and recreation—will reflect their central role in the life of neighbourhood residents, workers, and visitors.



## Promenades

As the most intimate street type, promenades provide places for play, relaxation, and connections to homes and small multi-functional spaces. Over time, through personalization by locals, they take on their own distinct appeal.



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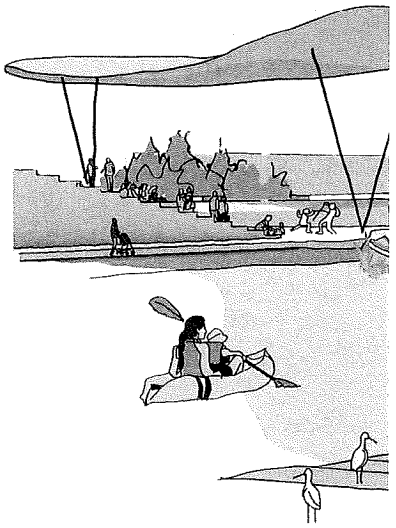
# What Makes This Neighbourhood Different? Adaptable and Integrated Public Realm

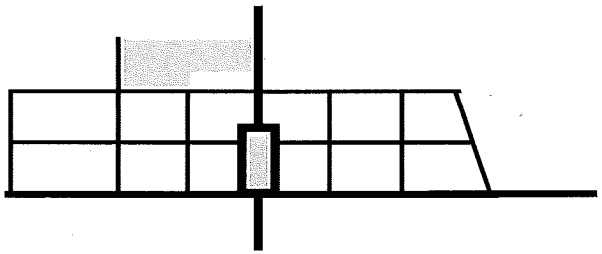
**A NEW SYSTEM OF HIERARCHICAL STREETS** makes it possible to think about the public realm differently. Rather than open space acting as an escape from the neighbourhood, the public realm will be a core element—integrated, not divorced, from the daily activity of residents. This shared public space will be interwoven into both the urban form and the surrounding area: flexible and always close at hand.

First and foremost, the public realm will prioritize pedestrians. The barriers and inhibitions created by the width and design of conventional streets, the rows of parked cars, and the noise and pollution of traffic will give way to a shared common space that becomes a canvas for community life.

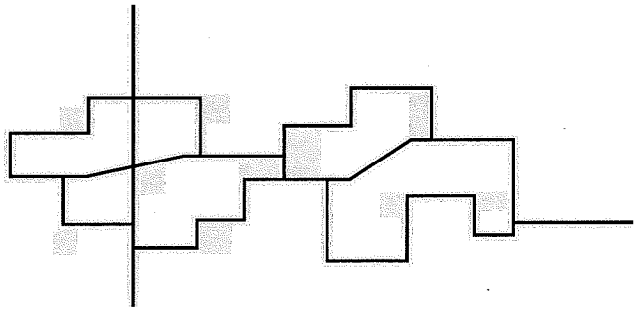
In this way, the public realm in a neighbourhood from the internet up will be a throwback to cities past. A stroll through an Italian hill town, a medieval city core, or a Moroccan souk reminds us how cities were designed before the automobile—based around the speed of the pedestrian, an intimate human scale, and the ability to interact with friends, neighbours, and merchants.

Technology enables greater flexibility in these new spaces, encouraging greater and more varied use of public space. Actively managed and reservable outdoor spaces will be available for pop-ups, food trucks, performances, exhibitions, and individuals alike. Customizable stalls that evoke the bazaars of an earlier time will showcase a range of retail or cultural experiences that might not fit cleanly into the above categories.





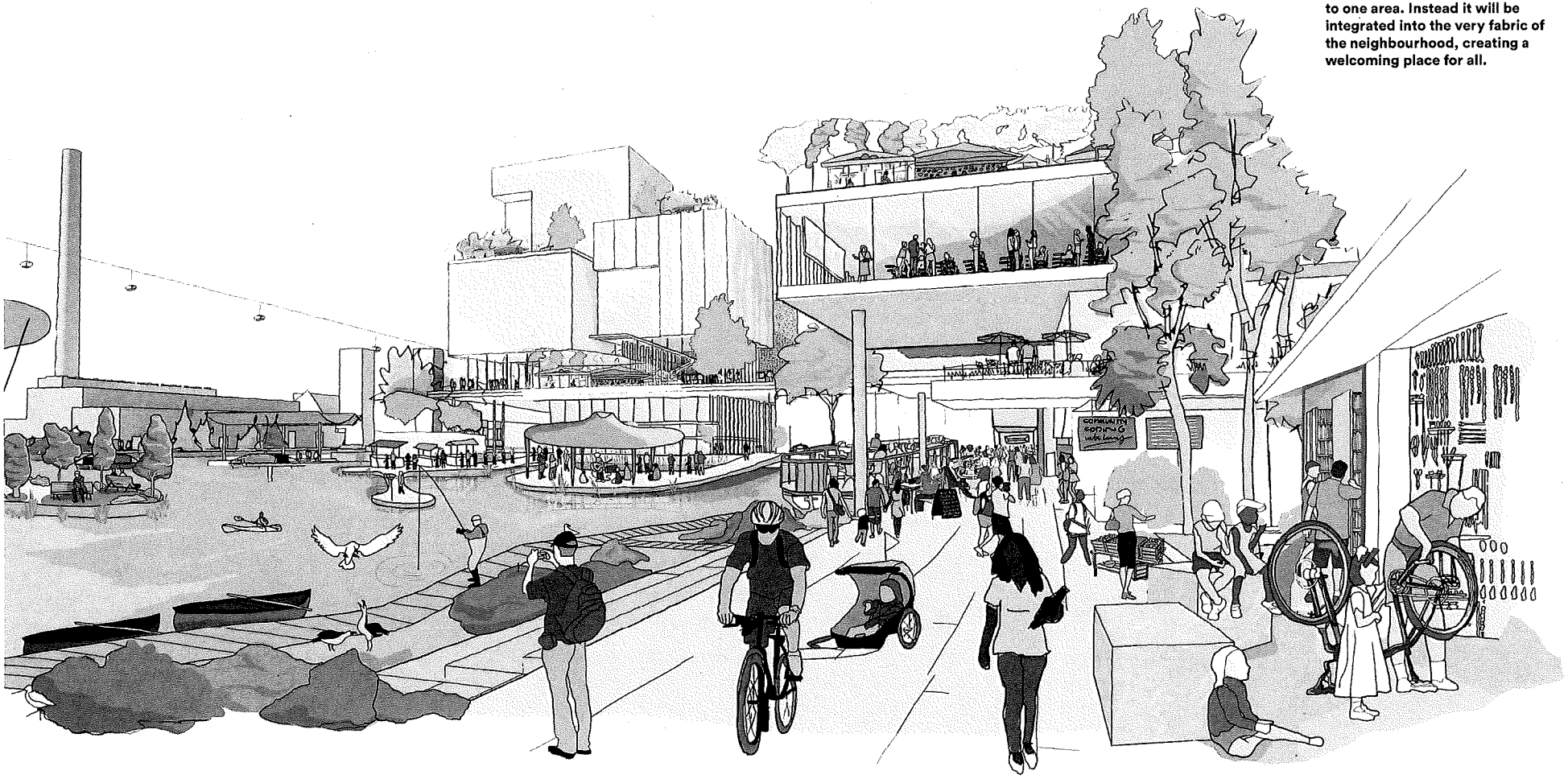
**Traditional Neighbourhood**



**New Neighbourhood**

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**The public realm in a neighbourhood from the internet up will not be confined to one area. Instead it will be integrated into the very fabric of the neighbourhood, creating a welcoming place for all.**



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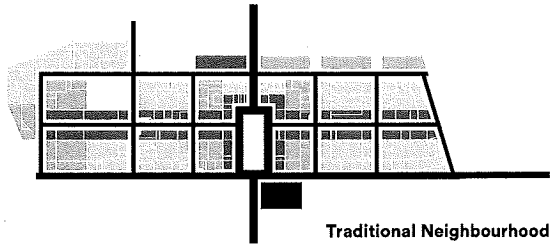
# What Makes This Neighbourhood Different? Radical Mixed-use Space

**THE BUILDING BLOCKS OF THE NEIGHBOURHOOD** will be a system of flexible-use spaces, operating from the scale of the sidewalk to the neighbourhood, enabling variety in both individual buildings and the overall urban form.

Contemporary urban life is defined by a culture of individual and community entrepreneurship, and a knowledge economy accelerating at rapid pace. People increasingly define their own careers, working independently or creating new ventures. Small businesses find opportunities in large flexible spaces, allowing rapid evolution through design, prototyping, and production. Communities seek a greater level of control over their environment, with more say over how the city is designed and managed, better access to information, and the ability to draw on their diversity to self-organize and plan cultural and civic activities.

Radical mixed-use space is defined by user needs at a wide range of scales—from flexible market stalls allowing a maker to produce and sell a product at street level, to reconfigurable "Loft" workspaces that can be shared by multiple companies and re-sized on demand, to apartments that can be enlarged with additional modules as a family grows.

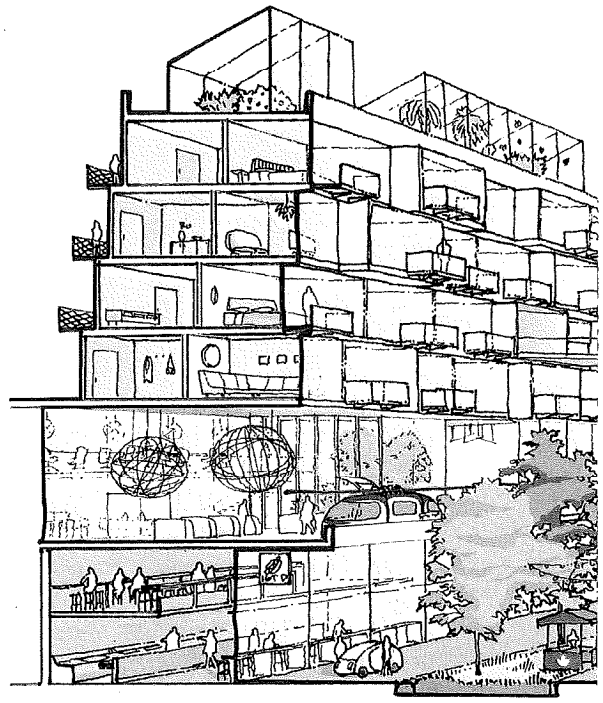
These malleable spaces, and the ability to mix them in new ways, will invert the normal hierarchies and separations of a purpose-designed urban development. But they are only possible with the integration of technology that enables efficient monitoring and safety standards, high space utilization, ease of access, and low transactional costs.



Traditional Neighbourhood

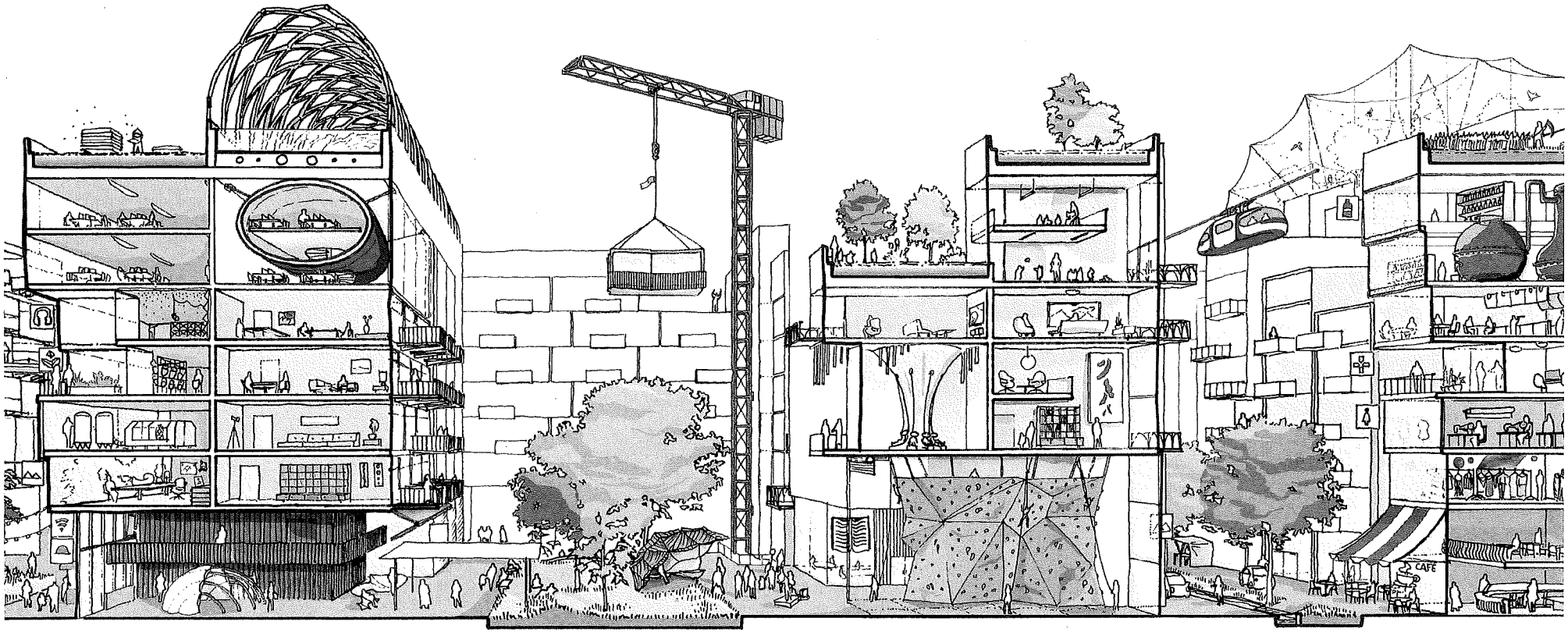


New Neighbourhood



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**A radical mixed-use environment means that the neighbourhood is always in flux, creating a dynamic community and enabling needs to be met at a much quicker pace.**




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# What Makes This Neighbourhood Different? Dedicated Space for Utilities

**UTILITIES IN A NEIGHBOURHOOD FROM THE INTERNET UP** will be off the streets and easily accessible, housed in a system of utility channels that prevent old infrastructure and messy road work from impeding innovation.

People tend to notice utilities only when they interfere with their lives. This happens when they fail, like during a blackout, or when utility work blocks traffic because it requires roads to be torn up. Both examples emphasize a critical aspect of utility services. People depend on them, and they are not designed for easy access.

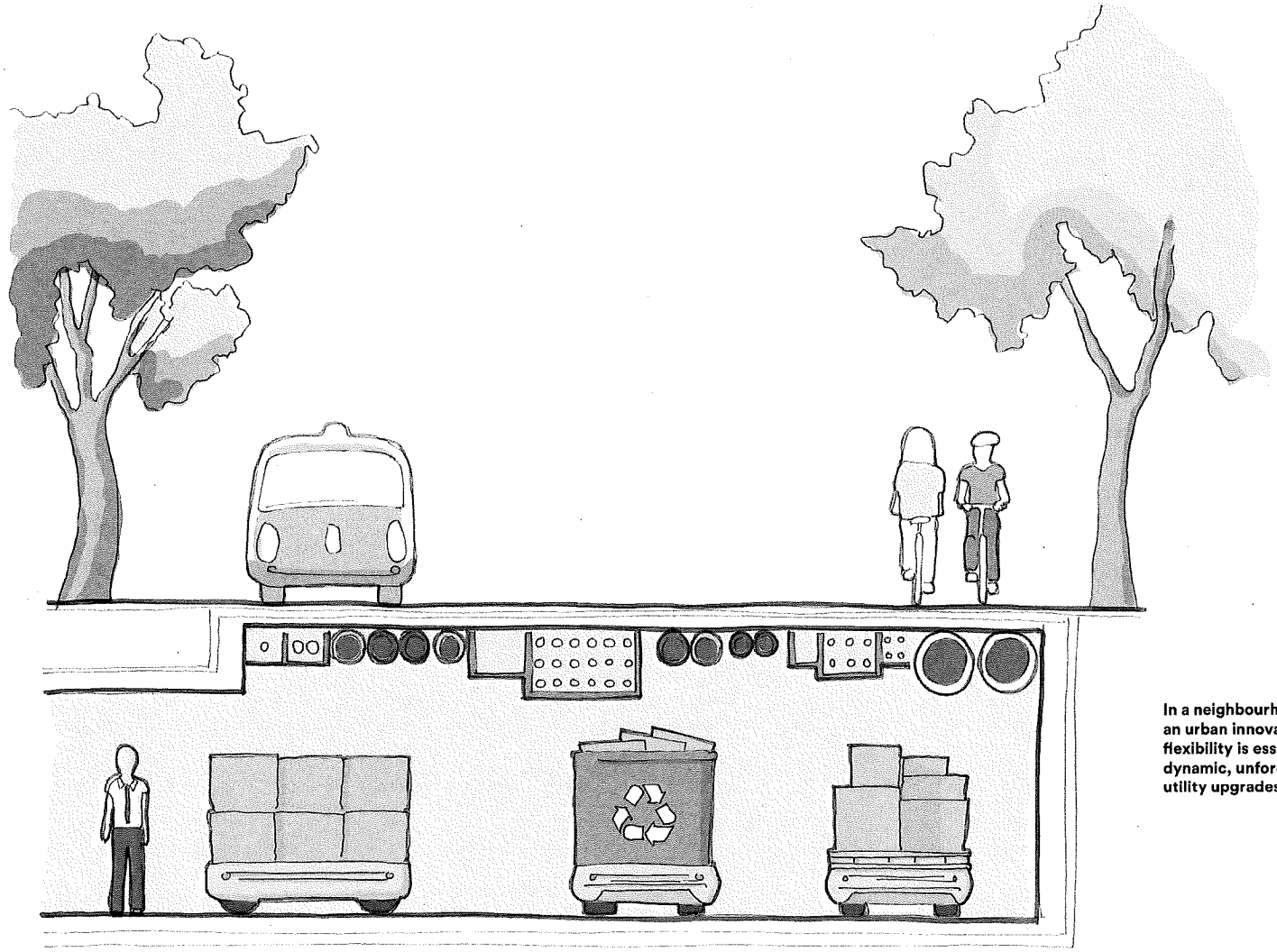
There are also moments when existing infrastructure impedes access to new services. Over the last century, a series of new network utilities have emerged: natural gas provided the first central source of lighting, electricity began as an in-building system for the wealthy but became a networked utility for the masses, and telephones became a basic utility of life. In the past three decades, cable television and fibre-optic communication lines have become basic needs for both business and homes. In each case, the creation of these networks took longer than it should have. Those who were late to receive new services found themselves at a disadvantage.

New neighbourhoods will provide space for utilities in a network of shared, easily accessible utility channels that exist beneath the public realm and reach into every floor on every building. By enabling utility upgrades that are easy and cheap for incumbents and new entrants alike, utility channels will ensure that the neighbourhood is open for innovation and equipped with the most advanced urban infrastructure at the lowest cost to users.

This underground infrastructure will create space for electrical infrastructure, water pipes, district level heating and cooling infrastructure, and telecommunications infrastructure, eliminating the need for excavation every time a new conduit needs to be installed and preventing the need to destroy road surfaces every time a line needs to be accessed for repair. It will also give workers easier access to those parts of the system that require the most frequent visits: where main lines are tapped to serve buildings, where meters and valves must be checked, and where optical switches need to be upgraded to process faster fiber-optic signals.

Utility channels will spur a renaissance of innovation by providing a new, easily accessed network connecting an entire neighbourhood. The channels will provide an invisible conduit for waste logistics and be useful as corridors for robotic deliveries of parcels. This new upgradeable network will be coupled with the operating systems in the digital layer of the neighbourhood platform, providing a path for cost effective, continual improvements.

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**In a neighbourhood built as an urban innovation platform, flexibility is essential for dynamic, unforeseeable utility upgrades.**

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# 3. Reimagining the Eastern Waterfront

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The Eastern Waterfront is an ideal place to create this new type of neighbourhood.

Sidewalk has begun to imagine what this place might be like, beginning with Phase One: Quayside. The pages here reflect the initial work Sidewalk has done to understand the site's unique qualities of place and extraordinary potential.

The ideas that follow are only the starting point of a journey that Sidewalk will take together with Waterfront Toronto to unlock the full potential of the Eastern Waterfront.

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# Born of a Pleasant Promenade

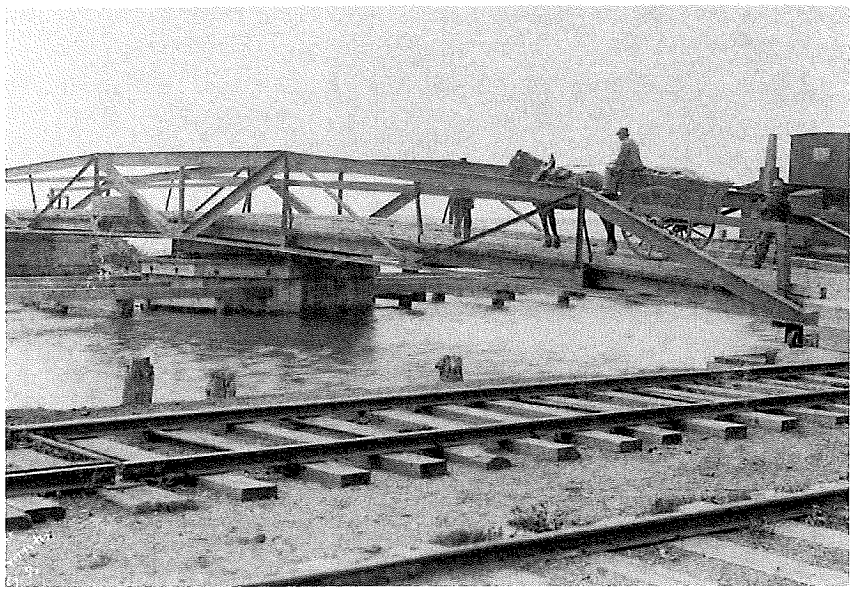
**AT THE FOUNDING OF THE TOWN OF YORK IN 1793,** the water's edge was reserved for the public. It was described as a "pleasant promenade, on which the burghers and their families should take the air and disport themselves generally"—an agreeable walk known as the "Esplanade." And agreeable it remained until the industrial revolution.

In the 19th century, railway companies saw the opportunity of a publicly owned corridor across the Toronto waterfront and converted the area into a right-of-way that formed a continuous wall of rail lines, cutting off the growing city from its lake. At the same time, new wharves and bulkheads pushed the shoreline southward to accommodate larger and larger ships. The waterfront became the city's first industrial zone.

Soon that early promenade had transformed into a site for factories that produced all manner of goods. Stockyards and tanneries, metal and wood works, a vast distillery, cold storage capitalizing on an abundant supply of winter ice from the lake: almost every category of manufacturer could be found gathered up against the water's edge. A vibrant Great Lakes shipping industry saw the daily passage of people and cargo—a trade that only increased in the early and mid-20th centuries with the completion of the Welland and St. Lawrence canals.

Logistics and storage facilities proliferated to serve bulk cargo traffic by rail and water. Parts of the waterfront became massive holding areas, leaving a trail of heritage structures originally designed for storage of goods in transit, including the grain, coal, and gravel silos that remain as the iconic totems of the Eastern Waterfront.

A different story unfolded to the east, where the Don River Valley met the lake, forming Ashbridges Bay, the largest natural marshland in the Great Lakes. The river delta long stymied use of this area for shipping, as silt deposits formed a less navigable slip of wetlands and sandbars, but industry's loss was the city's gain. The most lasting sandbar—the precursor to what today is Cherry Street—allowed residents to walk across the surface of the lake to Fisherman's Island. It became a popular destination for the type of simple outdoor enjoyment Toronto's founders had tried to reserve for the city from the start.



**Cherry Street Bridge, 1898.**

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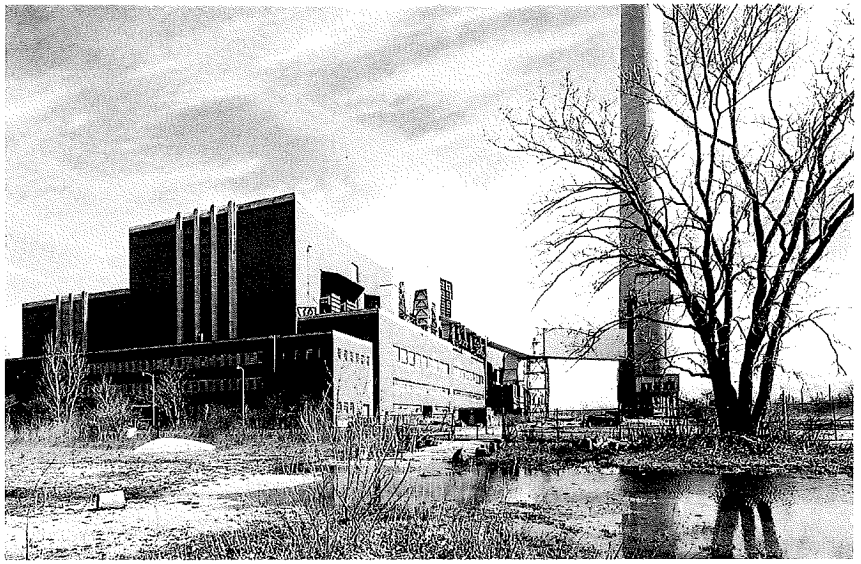
The Ashbridges Bay wetland gradually became a dystopian stew of municipal trash, raw sewage from the growing city, and toxic pollution from upriver stockyards mixed in a flood-prone area the size of downtown. Recognizing these conditions as a hazard to public health, the city's engineering department resolved to control the natural forces that had created it, filling the vast marsh and dredging and confining the Don River in a narrow channel. Completed between the wars, this new expanse of artificial land was envisioned as the locus for the next great wave of industrial expansion.

That wave never materialized. The frenetic growth of industry and manufacturing on the waterfront was on the wane. Instead, the Eastern Waterfront became home to vast open stockpiles of raw materials awaiting barge transport, and an attractive site for municipal utilities that could not be accommodated in the city's dense interior: the Ashbridges Wastewater Treatment Plant and the Hearn Power Station among them.

When the postwar craze for urban highways arrived, Toronto's waterfront was an obvious location. The creation of the Gardiner Expressway was a bold stroke of modernism, threading a high-speed auto route atop much of the city's most polluted and blighted land. Only a generation later, as manufacturers moved north beyond the city's limits, did the folly of the city's waterfront expressway start to become clear.

Today, the Gardiner stands in need of billions in repairs, but even as it gets rebuilt, the expressway's status as a much-maligned parapet is shrinking by the day. Of course, many Torontonians wish the city would just bury or collapse it, leaving a grand boulevard in its place. But something else is happening: new condos are crowding up against it as people clamor to live closer to downtown, and a new linear park is set to be built beneath it—an exceptional act of imagination that might just make one of the city's most maligned structures among its most treasured.

That the Gardiner could yet become one of the city's great assets could be a surprise finish to the latest chapter in the development of the city's waterfront.



**The Hearn Power Station, opened in 1951, was the site of Canada's first 100 MW steam turbo-generator set.**

Credit: Mark Wickens

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# Rediscovering the Waterfront

**NOW SOMETHING DIFFERENT IS HAPPENING.**

Waterfront Toronto has spearheaded this revitalization. In 1999, waterfront revival was deemed a matter of national importance, and all three levels of government came together to create Waterfront Toronto to lead this important mission. Since then, the Central Waterfront has taken shape and Downtown Toronto has recovered its lakefront as a public amenity—the city's welcoming "front porch." Now that progress is extending eastward.

The Eastern Waterfront is at another scale from Central Waterfront development; it is a district of some 300 hectares comparable in size to Toronto's entire downtown. Transforming the Eastern Waterfront will complete a long historical arc, as the city's lakeshore was shaped first by the desire for public access, then for 150 years by the imperatives of industry and shipping, and now back again to people.

Toronto's lakefront, with all of its contradictions and conflicts, is a powerful opportunity for new and innovative thinking. Already the Distillery District has become an all-season magnet, drawing Torontonians to its pedestrianized, brick-paved streets. Next door, the Canary District is a handsome showcase for a new, playful, and inviting urbanism. The waterfront is lighting up and the energy surrounding it will soon overcome the barriers that historically contributed to its neglect.

In time, the Eastern Waterfront will be Toronto's newest neighbourhood—or, more likely, a diverse set of neighbourhoods with their own unique personalities—and home to tens of thousands of Torontonians. The most exciting thing Toronto can do is to build more of what makes so many of its neighbourhoods beloved, and to give a modern, ambitious, and generous form to the elements that make the city a success.



**Located adjacent to the Redpath Sugar Factory, Sugar Beach Park and its iconic umbrellas welcome visitors to East Bayfront.**

Credit: Mark Wickens



**View from Simcoe Wavedeck, as cyclists pass along the Martin Goodman Trail**

Credit: Mark Wickens



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**Kids play on one of Toronto's Waterfront Wavedecks, new public spaces designed to reflect the beauty of Lake Ontario.**

Credit: Mark Wickens

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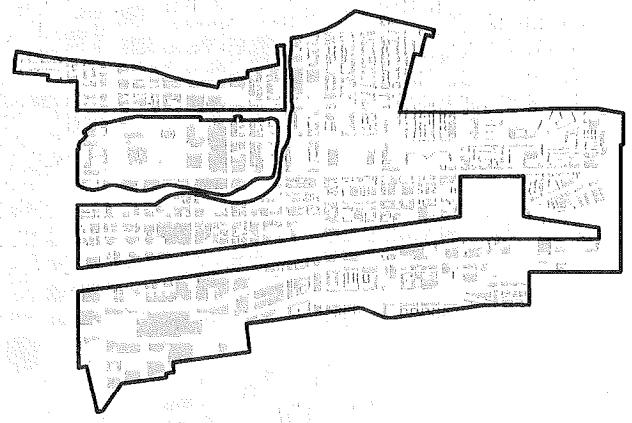
# Building at Scale

**WITH HUNDREDS OF HECTARES OF LAND** and years of effort building momentum and capacity, Waterfront Toronto has created an incredible opportunity for the city. The expanse of the Eastern Waterfront is large enough to absorb a meaningful share of the projected growth for Toronto, and to realize technological and urban design innovations at a system scale with implications for cities worldwide.

The best way to get a sense of the scale of urban life possible on the Eastern Waterfront is to compare it to areas comparable in size within Toronto and other well-known cities.

## Toronto

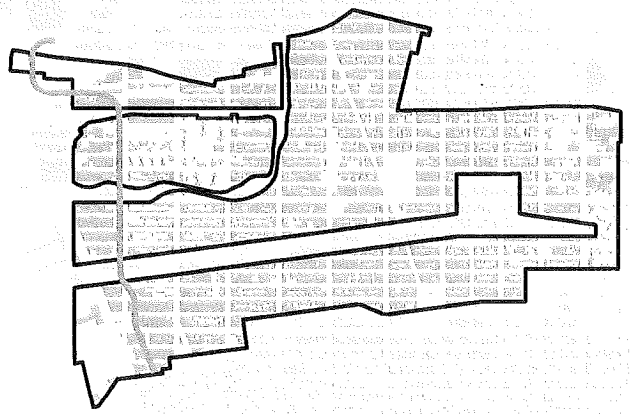
**Placed within Toronto, the Eastern Waterfront would span east-west from the Fashion District to the Distillery District, and north-south from City Hall to the lakefront, containing an area almost as large as Downtown itself.**



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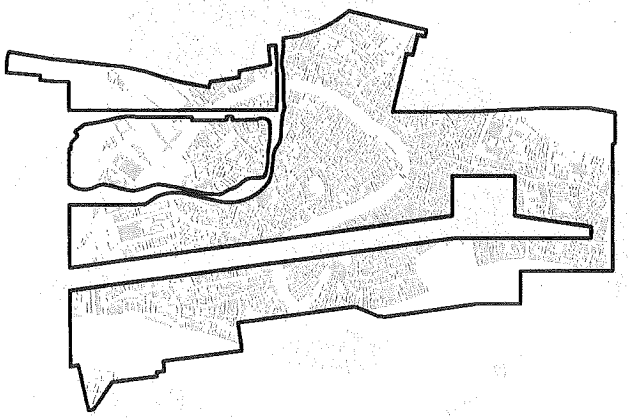
## New York City

**Placed within New York City, the Eastern Waterfront would span east-west from East River to Hudson River, and the full length of Manhattan's High Line from north to south—an area containing at least seven distinct neighbourhoods, each with their own individual character.**



## Venice

**As a point of comparison with another city built entirely on the water, the Eastern Waterfront would just about encompass the entire city of Venice.**



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# A Staged Approach Beginning at Quayside

**PHASED DEVELOPMENT ALLOWS FOR THE CYCLE OF IDEATION,** prototyping, and scaling that reflects the innovation process itself.

Waterfront Toronto's staged approach to development corresponds with Sidewalk's iterative model of city-building. By designating Quayside as Phase 1 of the next wave of Eastern Waterfront redevelopment, Waterfront Toronto has set the stage for Quayside to become an initial testbed and a dynamic site for experimentation.

Quayside will be the launchpad for innovations at increasing scale across the Eastern Waterfront. As waterfront development expands across Keating Channel to the south and east, each successive stage will adapt and expand upon the initial concepts and ideas prototyped in Quayside.

But each new phase of the project will do more than simply scale what came before. That is just the beginning. When combined and deployed across the Eastern Waterfront, the capabilities developed in Quayside will have an impact on urban life that cannot be achieved by individual pilots operating at the neighbourhood level alone.

Those are the knowns. But taken to its most advantaged stage, the urban innovation platform established in Quayside and the Eastern Waterfront will enable new approaches to city challenges that cannot yet be imagined. Just as no one could have known the internet would one day uproot printed media, or that streetcars and automobiles would transform Toronto's original town grid, great platforms build the unknown possibilities of the future into their very foundation.

The power of innovations that emerge on the Eastern Waterfront will transfer to cities around the world—including Toronto itself. The ideas conceived in Quayside and advanced in later phases on the Eastern Waterfront will inspire changes to the rest of the city as neighbouring communities learn from each other. In time, the waterfront will draw new people and energy in, improving the quality of ideas that make it back out—a positive feedback loop for the economic and social development of the greater Toronto region.

**The innovations that will establish Toronto as a world leading centre of urban innovation will start in Quayside and scale across the Eastern Waterfront.**



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# Imagining Quayside: A Hinge Point

**QUAYSIDE IS A QUIET CORNER** on the border of Downtown and the Eastern Waterfront, the last waterfront development parcel on mainland Toronto before the Port Lands protrude into Lake Ontario. Yet it occupies a strategic location when evaluated in context. Quayside is, in numerous ways, a hinge, connecting important places and concepts so that the sum is greater than the parts.

It is a geographical hinge, connecting Toronto with the new neighbourhoods yet to emerge across the Eastern Waterfront. It is a physical hinge, bridging the divide between land and water. It is a digital hinge—a testbed for urban innovations that can ultimately scale across the Eastern Waterfront. And a cultural hinge, celebrating the waterfront's industrial heritage in look and feel.

Of course, even as it functions as this critical nexus, Quayside must still be a vibrant, inclusive, mixed-use complete community in its own right.

Sidewalk's approach to making Quayside the first neighbourhood from the internet up centres around five planning goals:

- Quayside must differentiate itself as a radical departure from existing developments in Toronto and around the world.
- Quayside must integrate itself as the newest addition into Toronto's existing and diverse quilt of urban neighbourhoods.
- Quayside must offer affordability to a diverse set of Torontonians.
- Quayside must start the transition to a public realm planned around the pedestrian and not the automobile.
- Quayside must demonstrate the potential implications of the convergence of physical conditions, digital capabilities, and open standards on urban innovation—catalyzing a new urban innovation cluster.

**Quayside has the potential to be a true gateway between the urban fabric of Toronto's existing downtown core and the new neighbourhoods that will define its future Eastern Waterfront.**

Credit: Stink Studios



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# Between Land and Water: Living on the Lake

**MARINE BUILDING TECHNOLOGIES CAN ENABLE YEAR ROUND,** flexible uses on the water, opening up new opportunities for the integration of the water into daily life. As the Quayside neighbourhood wraps around its 1,680 meters of coastline along Parliament Slip and Keating Channel, public spaces, civic facilities, housing, or other uses can flexibly weave together the water and the neighbourhood.

Lightweight, movable, floating bridges can create multiple points of connectivity—between Quayside, Bayside, and Villiers Island—for pedestrians, cyclists, even self-driving vehicles. Arranged in direct response to demand or simply to provide new routes for transit access, floating bridges can easily coexist with ferries and other active maritime uses.

Floating parks can expand the public realm and soften the hard edge between land and water. Built on easily movable tiles or other structures, parks can be designed to provide near total flexibility in physical configuration and location, providing a dynamic experience and responding to weather and water conditions. Adding trees and vegetation on the water can also provide natural weather mitigation, particularly for wind conditions.

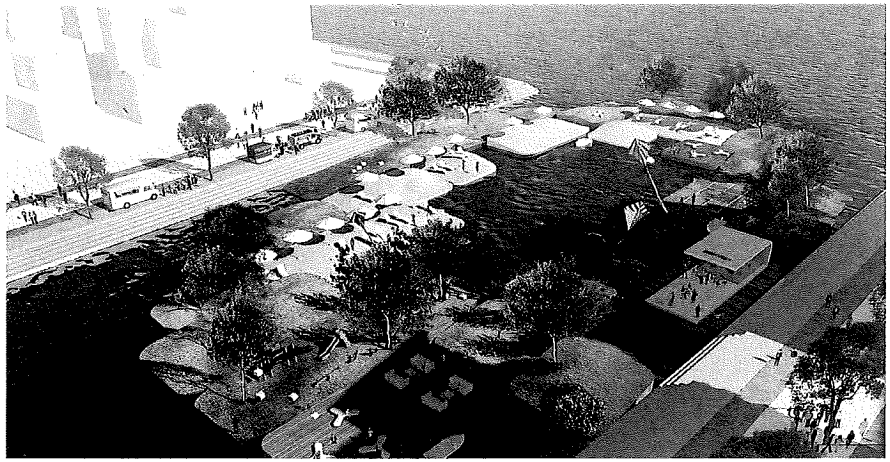
Waterborne civic uses, such as floating performance venues, can animate Quayside's public realm and create citywide cultural destinations that can be moved to other lakefront locations as desired. The inherent flexibility enabled by the water can create opportunities for adaptable, floating communities to be added to the waterfront housing supply.

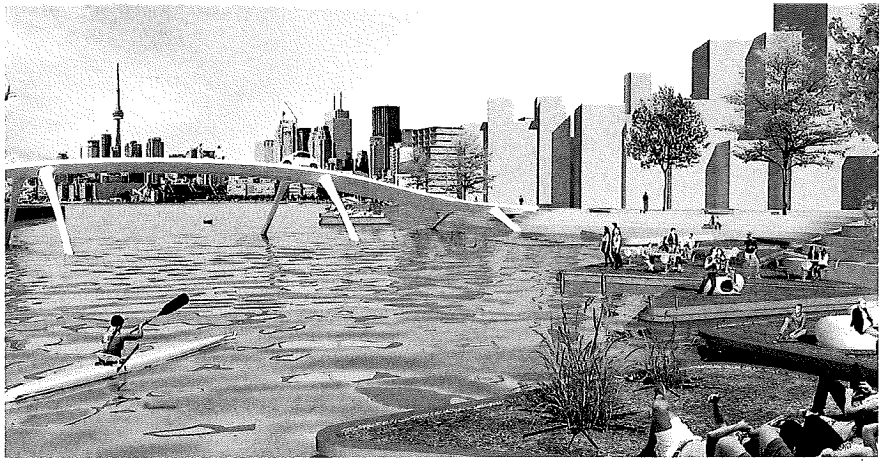
Quayside may even provide opportunity for near-term testing with self-driving boat technology, which over time may become an efficient tool for the movement of goods throughout the Eastern Waterfront. As a testbed, Quayside can establish approaches for building at the intersection of land and water that can scale across the Eastern Waterfront, which will amount to 11,940 meters of coastline after the Don River naturalization.

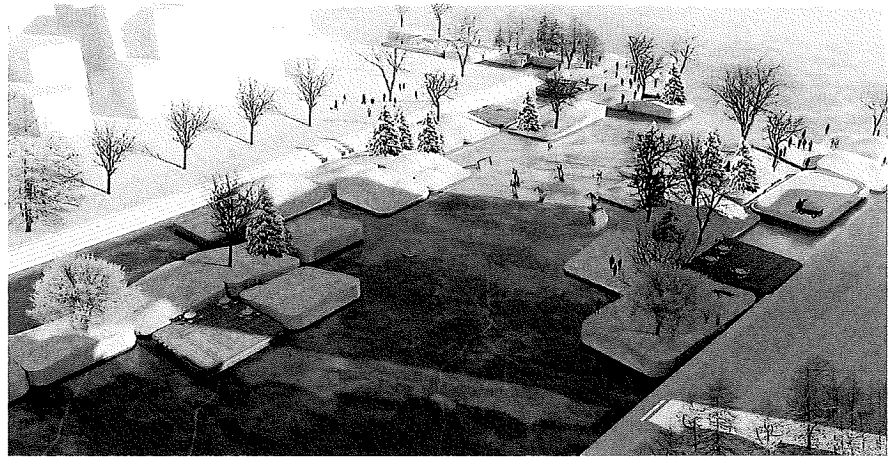
Once Waterfront Toronto's plan to naturalize the mouth of the Don River is complete, the Eastern Waterfront will have almost 12,000 meters of coastline. Inspired by this gesture to the site's natural ecology, Sidewalk believes the addition of a slender channel east of the Portlands Energy Centre will enable water-based travel throughout the entire Eastern Waterfront.



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**A park in Parliament Slip constructed on floating tiles can be curated into different configurations. The park would serve different uses in both summer (top) and winter (bottom).**

**In subsequent phases of development, the Ship Channel could host a range of uses, from portable, floating bridges that can be installed, removed, and moved over a period of days (top), to floating communities that bring adaptable building typologies to the water (bottom).**

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# Between City and Waterfront: Extending Queens Quay

**THE REDEVELOPED QUEENS QUAY IS AN EXCELLENT EXAMPLE** of a street redesigned for multi-modal transportation. Protected bike lanes and pedestrian paths encourage active uses, and the streetcar provides convenient public transit.

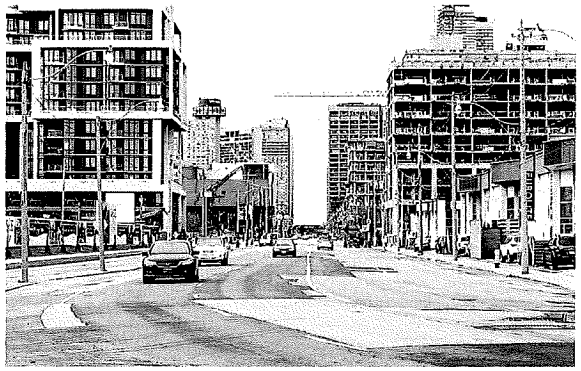
There is already broad consensus to extend Queens Quay East through Quayside to Cherry Street, though the design has not been finalized. Quayside is a perfect opportunity to continue Queens Quay as an active and vibrant spine that anchors a new community, designed specifically for the possibilities unlocked by new technology: programmable and flexible public space that is accessible to all, weather mitigation that enables people to enjoy the outdoors for more days each year, self-driving mobility that takes private cars off the street, and coordinated management of a rich modal mix.

The development approach in Quayside must activate the extension of Queens Quay without sacrificing its efficiency as a mobility artery. Sidewalk envisions a Queens Quay that feels much like the waterfront version of Queen Street or King Street, a grand boulevard connecting the Eastern Waterfront to Downtown, and a destination in and of itself.



**Revitalized Queens Quay, facing East.**

Credit: Brian Medina



**Existing Queens Quay, facing West.**

Credit: Mark Wickens



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**Reimagining how Queens Quay might look as Quayside explores alternative mobility strategies.**

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# Between City and Waterfront: Stitching the City

**PHYSICALLY AND PSYCHOLOGICALLY,** the Gardiner Expressway separates Downtown Toronto from the Eastern Waterfront.

It is a relic of an earlier time, when the waterfront was synonymous with industrial expanse and good urban design meant planning for cars. Today, the eight-lane elevated roadway and adjacent rail lines divide Quayside from the core of the city.

Vehicle underpasses exist on Parliament and Cherry streets, but the distance—a span of over 110 meters via the Parliament Street passage—is uninviting for pedestrians and cyclists. The Distillery District, on the north side of the rail berm, should feel more connected with the water; after all, its majestic brick buildings were originally right at the water's edge.

More broadly, while Toronto's subway and extensive streetcar network anchor a strong public transportation system, as the City's TOCore strategy notes, pedestrian and public transit access between downtown and the waterfront is challenging. This issue will only compound as development moves further into the Eastern Waterfront and further away from existing transit lines.

New mobility arteries that sprout from Quayside must not only be about connecting back to the already-developed waterfront to the west.

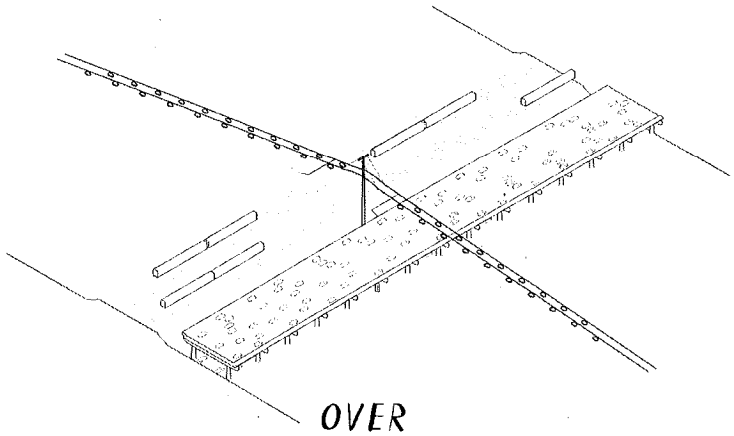
Instead, these connections should include paths north to King and Queen Streets, east to Leslieville, and south to the Port Lands. Transit infrastructure in Quayside should work in concert with the proposed East Harbour transit hub to stitch Eastern Toronto and the Waterfront into the city's infrastructure, and relieve some of the pressure on existing subway lines.

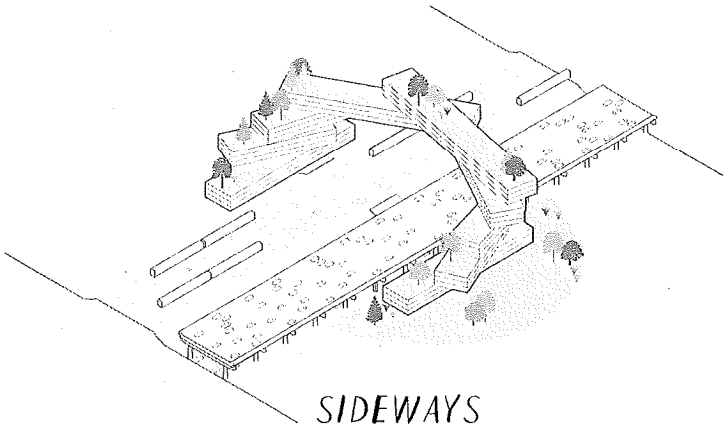
This challenge is one Waterfront Toronto knows well, and for which the city is already implementing creative solutions. Soon the Bentway will snake beneath the Gardiner on the Western Waterfront, creating new gathering place for residents and visitors. The development approach in Quayside must bring equally creative solutions to "The Stitch" in the Eastern Waterfront. There are many potential approaches, for example, to make crossing the Gardiner an experience that celebrates the character of this massive piece of infrastructure, while bringing Quayside and its so-close-yet-so-far neighbors together.

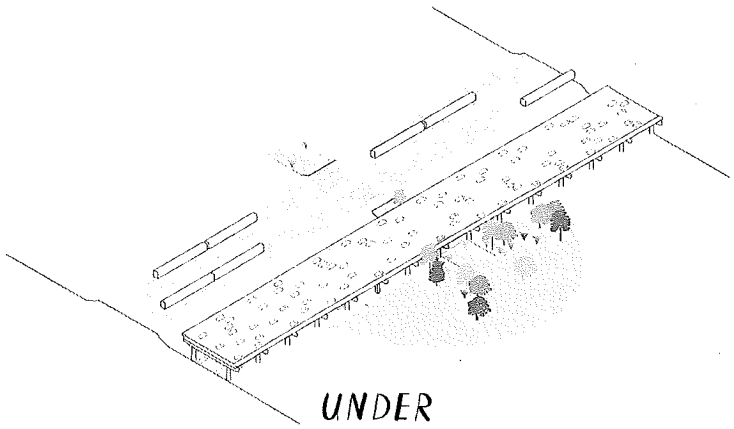
**Sidewalk wholeheartedly agrees with Waterfront Toronto's vision to create Gardiner crossings that stitch the city together.**

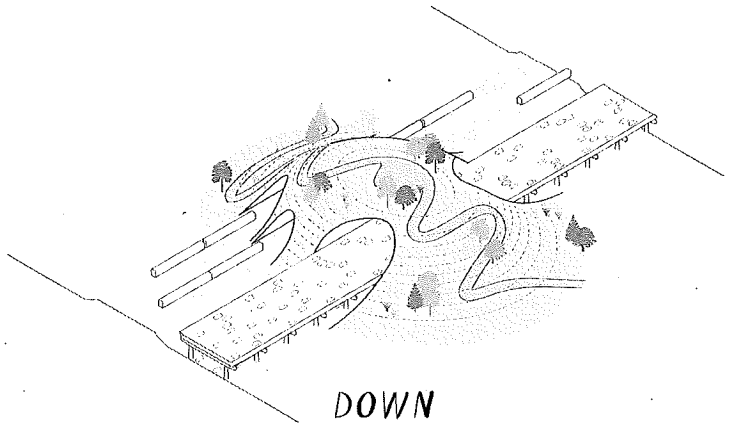


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# Between Old and New: Embracing Heritage

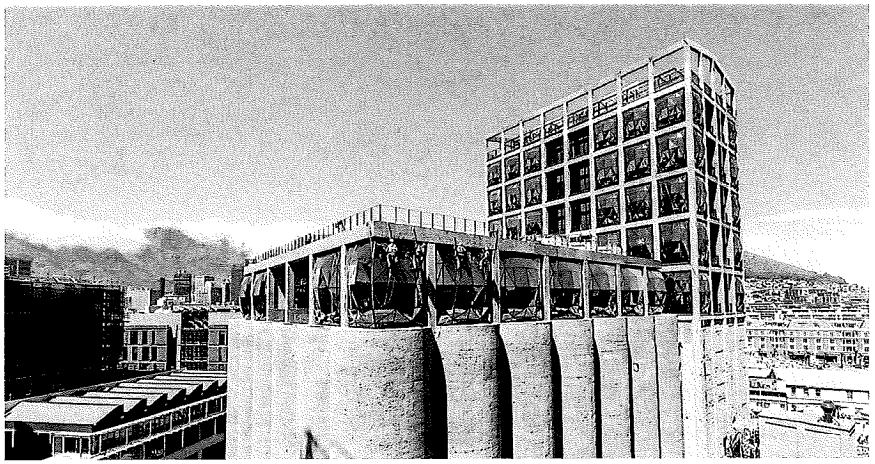
**NEW DEVELOPMENT OFTEN BENEFITS FROM EMBRACING HISTORY.** Sprinkled throughout the Eastern Waterfront are the grain silos and smokestacks that testify to the waterfront's industrial legacy, with the Victory Soya Mills Silo in the middle of the Quayside neighbourhood a prime example. The treatment of this authentic piece of Quayside's history should be highlighted, not hidden, and its towering structure should be celebrated.

Concrete silo structures have vexed cities and developers all around the world, but new design capabilities are increasingly enabling cost effective reinventions. In Cape Town, South Africa, construction of a contemporary art museum within the V&A Grain Silo is underway.

The silo can be an organizing component of the public realm within Quayside, and its location establishes it as a powerful visual gateway as visitors travel east on Queens Quay. Its central location within Quayside may also position it to play a pivotal role as a node in a mobility network connecting the Eastern Waterfront and the city.

The silo structure could ultimately become the symbol that instantly comes to mind when people think of Toronto's urban innovation district in the Eastern Waterfront—a counterintuitive coda for a structure that was built 60 years before the iPhone was invented.

As development scales across the Eastern Waterfront, the Hearn, Cherry Street Bridge, and the Fire Hall on Commissioner Street present similar distinctive opportunities to be repurposed.



**The historic grain silo at the V&A Waterfront in Cape Town, South Africa is being converted into the new home of the Zeitz MOCAA permanent contemporary art collection.**

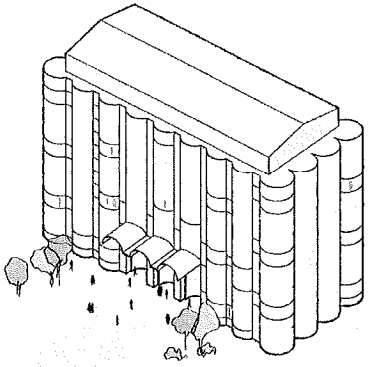
Credit: Navigator



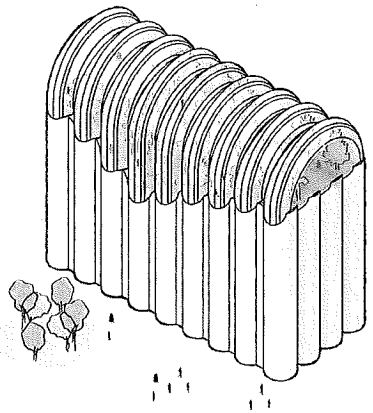
**Victory Soya Mills Silo at Quayside**

Credit: Mark Wickens

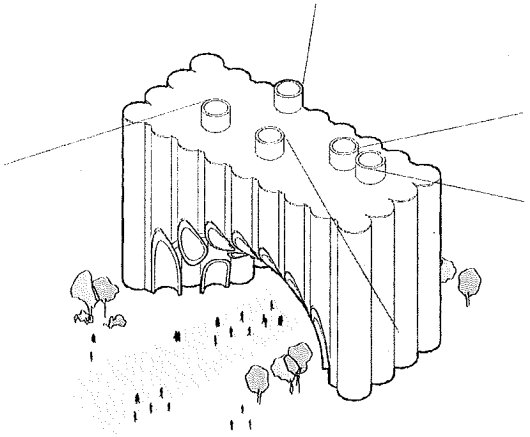
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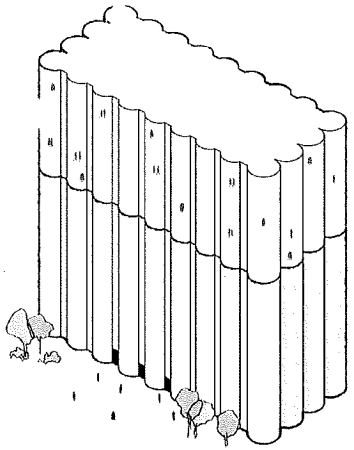


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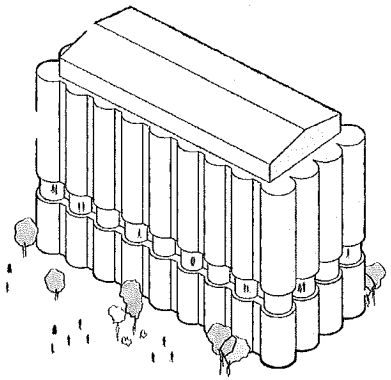


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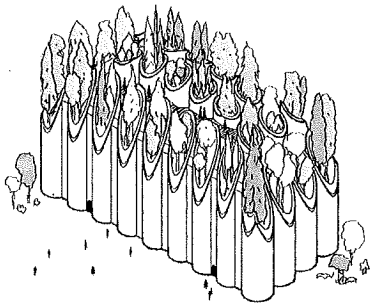
**Victory Soya Mills Silo, an icon of Quayside's industrial past, may well become a symbol of its future. The team at Sidewalk explored a series of ideas that would simultaneously pay homage to the site's heritage while creating a beacon for its innovative future.**



HOTEL



TECH INCUBATOR



GARDEN

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# Scaling the Network: The Greater Eastern Waterfront

**QUAYSIDE WILL BE JUST THE FIRST NODE** in a network of interconnected neighbourhoods. Over time, a network of neighbourhoods will extend out across the Eastern Waterfront, forming a set of diverse communities united by a larger system of communication and interaction.

The true potential of the platform is achieved when multiple neighbourhoods are interconnected. Whereas a neighbourhood of a few thousand people will catalyze an initial market opportunity to attract third parties to the platform, a series of networked neighbourhoods will be powerful enough to draw companies and entrepreneurs from all over to take part in Toronto's new ecosystem. As the network grows, it will begin to realize the possibilities of urban innovation at the scale of an entire district.

A Loft pilot at Quayside can create radical mixed-use along neighbourhood blocks for hundreds of people; this same concept, applied across the Eastern Waterfront, means transforming the way tens of thousands of Torontonians interact with the built environment and accelerating the speed at which streets evolve. A cluster of Passive House buildings at Quayside will scale to a new global standard for building energy efficiency that replaces LEED and supports a climate-positive district.

It is not just about scale. There is additional combinatorial impact that occurs when boundless innovation comes together in cross-cutting ways.

When Sidewalk's mobility solutions in Quayside lead to an Eastern Waterfront free of privately-owned cars, it does not just save families money on car-ownership and make travel more convenient. It combines with a Ground-Traffic Control System to turn every corner into a transit stop, eliminating the fixed nodes that drive up cost of living in dense areas. It combines with Loft structures and programmable space to repurpose parking for whatever the community needs most: from new housing to a ribbon of park. It combines with the advanced microgrid to power all vehicles with renewable energy, keeping the skies cleaner and hydro cheaper.

**As the development on the Eastern Waterfront grows, each new neighbourhood adds a node to the network, increasing the value of the network overall.**

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# A Network of Neighbourhoods

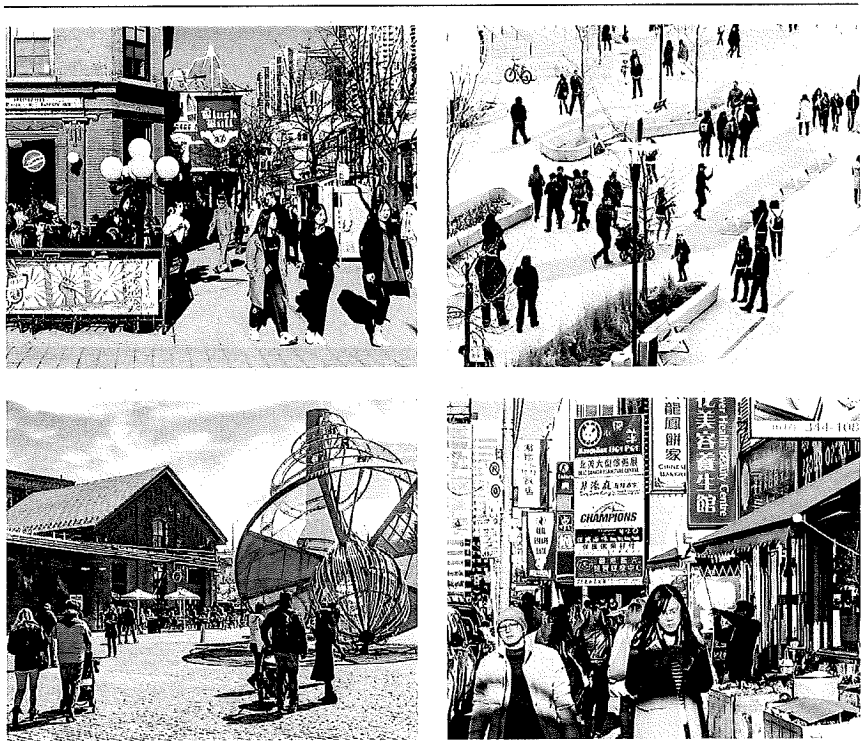
**NEW NEIGHBOURHOODS WILL UNFURL A VIBRANT, DIVERSE QUILT** across the waterfront, a natural extension of the "City of Neighbourhoods" that forms Toronto's unique character.

Eventually, the Eastern Waterfront will be composed of an entire network of neighbourhoods, with a wide variety of designs and forms possible within the basic structure of a district. The waterfront must express and extend the natural, organic diversity of Toronto itself. The most exciting thing Toronto can do is to build more of what makes so many of its neighbourhoods beloved, and to give a modern, ambitious, and generous form to the elements that make the city a success.

The site is large enough to support a dozen or more neighbourhoods of distinct personality—freed from the confines of traditional development. The street hierarchies will restrict conventional vehicles, with bike highways and autonomous ferries feeding an internal mobility network primarily serving pedestrians, cyclists, and autonomous transit. A free-flowing public realm will emphasize accessible streetscapes, short blocks, and flexible pavilions of radical mixed-use, eliminating the divide between home, work, and play. The power of nature and water will be ever-present: a green ribbon will surround the whole district, and a series of blue "water rooms"—from floating theatres to homes—will create new life on the lake.

This multi-directional dynamic will also connect residents of the new district with communities throughout the Toronto metropolitan region, forming an economic and knowledge ecosystem, and advancing Toronto's global role as a magnet for urban innovation. While Quayside and the Eastern Waterfront will be a showcase for urban design and community innovation, they must at the same time become fully embedded into the fabric of Toronto's existing neighbourhoods—a celebration of diversity within a larger sense of community for all Torontonians.

## Toronto's Neighbourhoods




**New neighbourhoods on the Eastern Waterfront will be a natural extension of Toronto's existing neighbourhood network.** Credit: Mark Wickens



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# The Waterfront of the Future

**EXTENDING DOWNTOWN'S ENERGY,** and building off the ideas initially prototyped in Quayside, the greater Eastern Waterfront will be both a great place to live and work and a magnetic destination.

In time, the Eastern Waterfront will be Toronto's newest district, and home to tens of thousands of Torontonians. Only rarely has the city been able to build downtown communities from whole-cloth. Fifty years ago, the development of the Esplanade demonstrated Toronto's skill at creating dense, vibrant and mixed communities. More recently, the redevelopment of Regent's Park has reaffirmed the city's knack for incorporating inventive public amenities.

But the Eastern Waterfront is of an altogether different scale, and is already coming to life.

In the Eastern Waterfront, the ideas imagined and tested at Quayside can achieve the scale necessary to redefine urban life, positioning Toronto and Canada as a world leader in urban innovation, and delivering step-change improvements in quality of life to residents and communities.

**The Waterfront of the Future is a series of communities at the nexus of the lake and the city.**

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# Explanatory Note: A Holistic Approach to Planning

**THE ROLE OF QUAYSIDE AS A TESTBED** for innovation will be further enhanced if the Waterfront Toronto-controlled parcels are planned in concert with the adjacent sites owned by the Great Gulf Corporation and the 3C development consortium. Given the benefits that could result from the larger scale and a coordinated approach, Sidewalk's evaluation of the Quayside opportunity has included consideration of the broader Quayside neighbourhood.

Preliminary contact with both parties has been encouraging, and Sidewalk hopes that an initial priority will be to formally engage both in a collaborative planning process. Sidewalk's assessment of the Quayside neighbourhood has been based on an understanding that any ideas for the broader area will require the participation and approval from other parties.

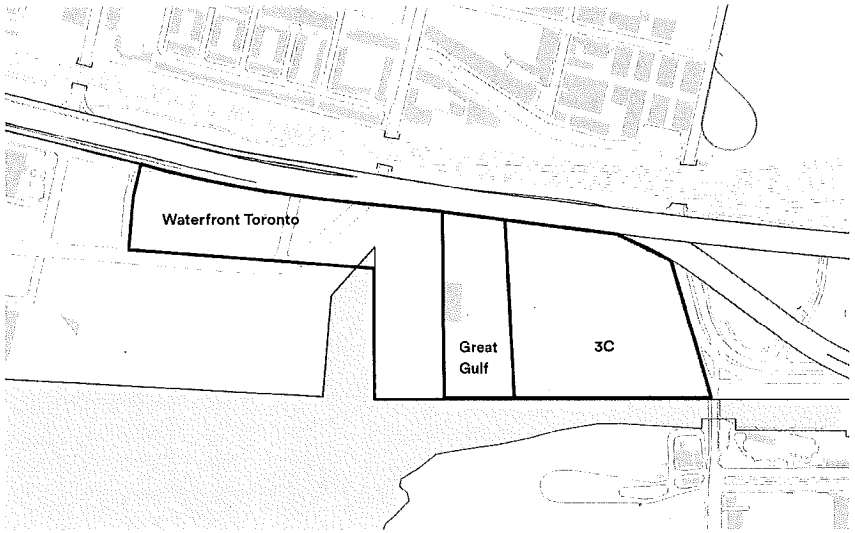
Expanding the project area from Waterfront Toronto's 12 acres (assumed to include the two small private parcels adjacent to Parliament Slip that Waterfront Toronto has indicated will be included within its Quayside development plans) to the full 33 acres enables innovation within Quayside to expand from the building level to system and neighbourhood scale.

Experimentation with the impact of autonomous mobility on the design of streets, for example, can be undertaken with the distance and density afforded by the larger neighbourhood scale. Sustainability solutions—such as a microgrid that balances power usage, or a thermal grid that utilizes waste heat and cool—not feasible on smaller developments can become achievable, too.

Quayside can contribute even more as the launchpad toward a holistic vision for the Eastern Waterfront if its public realm, mixed-use development program, and urban design are considered in a coordinated manner, beyond just a shared waterfront esplanade and the extension of Queens Quay.

As part of initial visioning and analysis, Sidewalk evaluated objectives considering both Waterfront Toronto's Quayside sites, and the full Quayside neighbourhood in the development of preliminary concepts.

Population growth projections for Toronto show increasing concentrations in the downtown core and the Eastern Waterfront, with 10,000 new residents moving to the Downtown each year, doubling its population by 2041. As this trend continues, growth will increasingly push outward to the southeast, directly towards Quayside and the greater Eastern Waterfront.




**The broader Quayside neighbourhood, including privately owned parcels, should be considered holistically.**



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Without a deliberate development approach, Quayside could succumb to the market pressure for upper-market residential that has recently driven downtown and waterfront development, and preclude the longer-term benefits of establishing a truly mixed-use program and more complete community.

With these factors in mind, Sidewalk considered a variety of programs that range between 5.5 and 6.5 million square feet.

In all cases, the total amount and distribution of square footage among different uses was considered in light of market conditions. The goal was to maximize the amount of density on the site without sacrificing the principles on which Quayside should be built: a generous public realm, a true mix of uses, strong commercial activity, and inclusivity and affordability for a broad range of Torontonians.

Sidewalk believes that its development approach will house more than 5,500 jobs within the Quayside neighbourhood, across a range of sectors. The combination of Google's presence and urban innovation institute pulling together academia and industry will give rise to an active innovation cluster in Quayside.

The demand in the downtown Toronto market is already absorbing residential product at an aggressive pace. Given the strength of this demand, the controls on density within Quayside are most likely to stem from the balance of urban design decisions, an emphasis on planning around the public realm, and policy priorities that may value experimentation over short-term revenue.

Broadly, Sidewalk's preliminary estimates indicate that Quayside is likely to be approximately 65 percent residential, with the balance including commercial, retail, hospitality, cultural, academic, and community uses spread across a range of adaptable building typologies. Sidewalk's belief in mixed-use development also informs its approach to affordable housing, which in all scenarios has been distributed throughout the site's residential program, as opposed to being isolated in individual buildings.

Quayside's development program will ultimately be the result of an iterative, consultative process jointly undertaken by Sidewalk and Waterfront Toronto, in which innovation, community priorities, policy objectives, placemaking, phasing, infrastructure, economics, market, site planning, and technical issues will be thoughtfully merged.

Sidewalk's approach to understanding the planning potential of the Eastern Waterfront included the First Gulf Corporation's East Harbour project, as it is a critical component for the growth and development of the entire Eastern Waterfront.

Sidewalk would like to acknowledge the contributions of Beyer Blinder and Belle Architects & Planners (BBB), Brookfield Financial Real Estate Group, BuroHappold, Deloitte, Heatherwick Studio, Partnership for Architecture and Urbanism (PAU), Waterstudio, Jason Polan and Mark Wickens.

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# 4.

# Purposeful Solutions

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Sidewalk's purposeful solutions together form its urban innovation platform for Quayside: both the platform's digital layer and component parts of its physical layer.

Sidewalk's team has also begun to consider how these ideas will scale on the Eastern Waterfront, and what more will be possible there.

The ideas presented here are only a starting point.

A collaboration between Sidewalk and Waterfront Toronto will build on this pathbreaking vision—and make it a reality.

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# Digital Layer

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The digital layer allows efficient operation of the neighbourhood by providing a single unified source of information about what is going on. It also supports innovation by providing a set of well-documented and supported APIs for third parties to build on. Furthermore, by pushing as much as possible of the neighbourhood infrastructure into software rather than hardware, it increases flexibility and reduces lock-in to outmoded technologies.

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# The Digital Layer

JUST AS COMPUTER AND SMARTPHONE OPERATING SYSTEMS keep the device running smoothly but also allow innovators to create new apps, the digital layer is designed to keep the city running smoothly but also encourage residents, staff, startups, and larger companies to bring their most creative ideas to bear on improving life in the city.

Sidewalk's digital layer will follow the following four principles:

① Enable more value creation than you capture. Good platforms focus on enabling others to extend the platform in ways that cannot be predicted ahead of time. Platforms should function as meritocracies that provide priority, resources, and acclaim to the most talented, engaged, and valuable participants. For example, the Toronto PATH system for pedestrians provides a platform that stores, building owners, and the city have collaborated to build, and which has resulted in outsize benefits to residents, visitors, the business community, and the city.

② Provide a stable and intuitive but always improving interface. Platforms must change as users' needs evolve over time and technological capabilities expand. But each platform update imposes costs on developers. The pain of platform improvement can be managed through agile development, incremental testing and implementation, elegant functionality, and intuitive and well-documented interfaces. But platform providers need to be humble and understand the need to "earn" the right to upgrade by providing exceptional value and close support.

③ Prioritize modularity and interoperability. Successful platforms allow developers and users to engage selectively. Modular design allows developers to build up platform functionality from basic components. This reduces application development time by standardizing functionality, reducing waste, improving reusability of designs, increasing openness, enabling greater resilience, and allowing platforms to serve multiple segments simultaneously rather than optimizing for a single type of user.

④ Never compromise user privacy. In addition to the flexibility, personalization, and efficiency that platforms provide, it is important that they maintain high standards for privacy and security. Furthermore, it is not sufficient to provide technical protections—the platform must also allow people to see and understand how their data are used, and be able to control those uses. Platforms can only flourish if their users trust and value them—and that trust comes from clear, consistent, and well-enforced policies for handling of personal information.

Sidewalk is actively developing the digital layer for its platform, which contains four essential components. A Sense feature knits together a distributed network of sensors to collect real-time data about the surrounding environment, enabling people to measure, understand, and improve it. A Model component—in development by Sidewalk's Model Lab—can simulate "what if" scenarios for city operations and inform long-term planning decisions. A Map component collects location-based information about the infrastructure, buildings, and shared resources in the public realm. An Account component provides a highly secure, personalized portal through which each resident accesses public services and the public sector. The platform mediates the interface with the physical environment

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## Neighbourhood APIs

The digital layer will include a set of APIs, creating a stable and well-designed canvas on which developers can build applications to reimagine and reinvent how the city works.

In much the same way that software platforms like Apple's App Store, the Google Play Store, and Amazon Web Services have stimulated creativity on the web and in personal devices, the digital layer provides a set of APIs, with documentation and developer support that will inspire the same creativity in the city.

APIs include regulated access to city data and the ability to interact with the city infrastructure in ways that are safe and consistent with other uses.

Providing a programmable interface to the city will unlock possibilities for application designers—many of which cannot be anticipated. The platform will be a magnet for civic-minded software developers and technologists, and Sidewalk will provide a co-working space for students, entrepreneurs, and academics who want to advance the state of the art in urban technology.

Sidewalk expects that many residents, in general, will be attracted by the idea of living in a place that will continuously improve.

Standardized data formats and well-defined interfaces will enable the digital layer to adapt as technology changes over time. Cities benefit from the ability to choose from the widest variety of vendors and service providers, so it is important not to lock into a particular hardware or software solution.

For example, defining standard ways to provide information about places and things in the city makes it possible both to change the underlying database technology and to choose different providers and consumers of the directory information over time. Likewise, as computer vision algorithms and sensor resolution improves, it will be possible to swap in new algorithms and sensors to improve accuracy and frequency of measurement of the public realm.

## Bootstrapping in Quayside

A production version of the entire digital layer needs to be complete to open Quayside.

This will enable experimentation with a broad range of sensors, initially over-provisioned, to enable parallel experimentation with multiple technology approaches. The size of Quayside makes it feasible to deploy cameras with different capabilities covering the same spaces. This will help Sidewalk evaluate trade-offs in technology and cost with apples-to-apples detection tasks on the same region. Likewise, Quayside will have multiple overlapping communications networks—an opportunity to evaluate relative value.

Some operational processes can be managed manually at the Quayside scale, such as monitoring elements of the public domain in need of maintenance. This presents an opportunity: these manual processes can be used to train machine learning models.

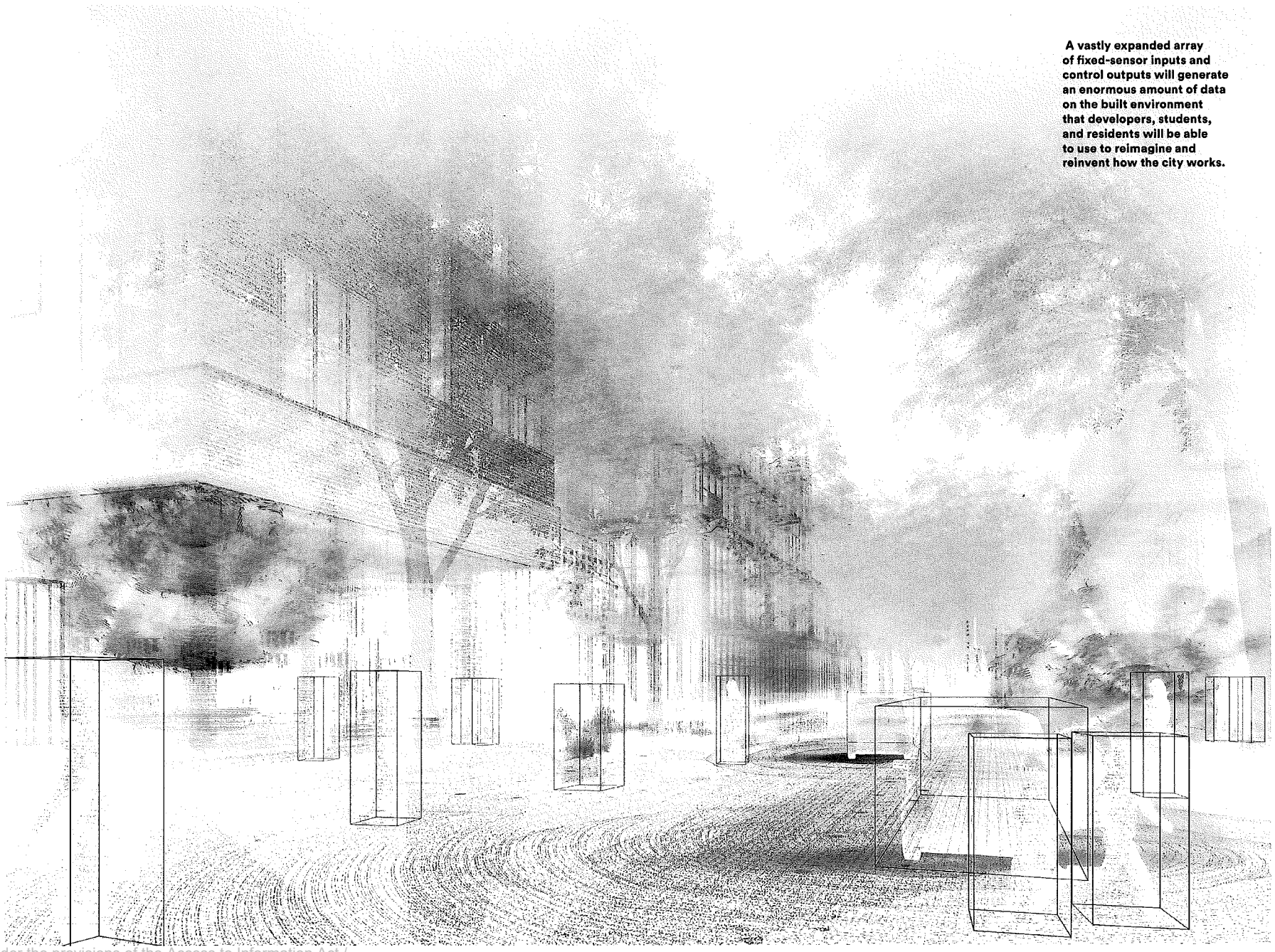
For example, for systems to be able to detect when a trash bin needs to be emptied, the system needs multiple examples of empty bins and overflowing bins. This "training data" can be used to create a computer vision model that will be able to make predictions on its own later. Capturing the regularities in patterns of full/empty cycles, and the environmental features that are likely to give rise to a full bin (e.g., a public concert in a plaza), will enable the system to anticipate a full bin.

This learning phase is human-intensive, but will swiftly result in generalizable models that will make Quayside more efficient and will themselves be ready on day one for wider implementation in the Eastern Waterfront.

The urban innovation institute Sidewalk envisions for Quayside will be an asset in the development of the digital layer. The institute will be a place for collaboration and discussion, and an unprecedented opportunity for faculty and students to test their ideas in a real urban environment. The institute will support cross-discipline, graduate-level degree programs, a broad range of faculty research with areas of deep specialty, such as application of artificial intelligence, and research and curriculum with potential reach into policy, governance, finance, and other relevant disciplines.

The institute will also be an informal location for people to collaborate. A dedicated staff will nurture the developer community and make connections between groups. A dedicated technical staff deeply versed in the details of the digital layer will be able to advise on its use, help new developers get up to speed, debug issues, and take lessons from this process back to the platform development team to effect improvements to the platform and APIs themselves.

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**A vastly expanded array of fixed-sensor inputs and control outputs will generate an enormous amount of data on the built environment that developers, students, and residents will be able to use to reimagine and reinvent how the city works.**

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# Sense

**THE FIRST STEP IN IMPROVING QUALITY OF LIFE AND EFFICIENCY IN A CITY** is understanding it. As the cost of sensors falls and Internet of Things technology develops, ubiquitous sensing becomes feasible, and enables a deeper understanding of the urban environment.

## Measurement and Sensors

It all begins with collecting useful data about the physical environment in a way that is deeply respectful of individual privacy. Over time, sensors have become less expensive, smaller, and more power-efficient. Simultaneously, the artificial intelligence techniques required to make sense of their output have improved significantly—in part due to advances in artificial neural networks led by Geoffrey Hinton from the University of Toronto (and Google).

Sensors range from low-bandwidth thermometers, which transmit a single, slow-changing number, to high-resolution cameras that capture millions of pixels dozens of times per second. Cameras deserve special attention because they raise issues of privacy. Rather than transmitting and saving full-bandwidth video, as much as possible Sidewalk will interpret the video on the same device as the camera and transmit only metrics like vehicle and pedestrian flows or the status of street infrastructure.

Quayside, in particular, presents an opportunity to instrument an area quickly with a range of production and experimental sensors, and to learn by quick iteration. The lessons from this rapid experimentation can be applied on a scaled-up basis in the greater Eastern Waterfront. For example, Quayside, will shed light on the tradeoff between camera resolution, deployment density, cost, and direct value to neighbourhood administrators and residents.

Sensors that Sidewalk expects to deploy include (1) air quality sensors (carbon monoxide, particulate matter, sulfur dioxide); (2) noise level sensors (noise generated by vehicles, construction, human activity); (3) radar, laser rangefinding, and computer vision (flow of vehicles, cyclists, pedestrians, state of the urban environment); and (4) hyperlocal weather (temperature, wind speed, humidity)

## Analytics

Collecting data is not valuable in and of itself. To understand what makes the urban environment work well, and detect when it is underperforming, it is necessary to perform longitudinal analysis, and be able to distinguish normal states from anomalous ones. Analytics based on measurements over time will allow users to understand variation in urban conditions, and why that variation arises—both by improving human intuition, but also by building predictive models.

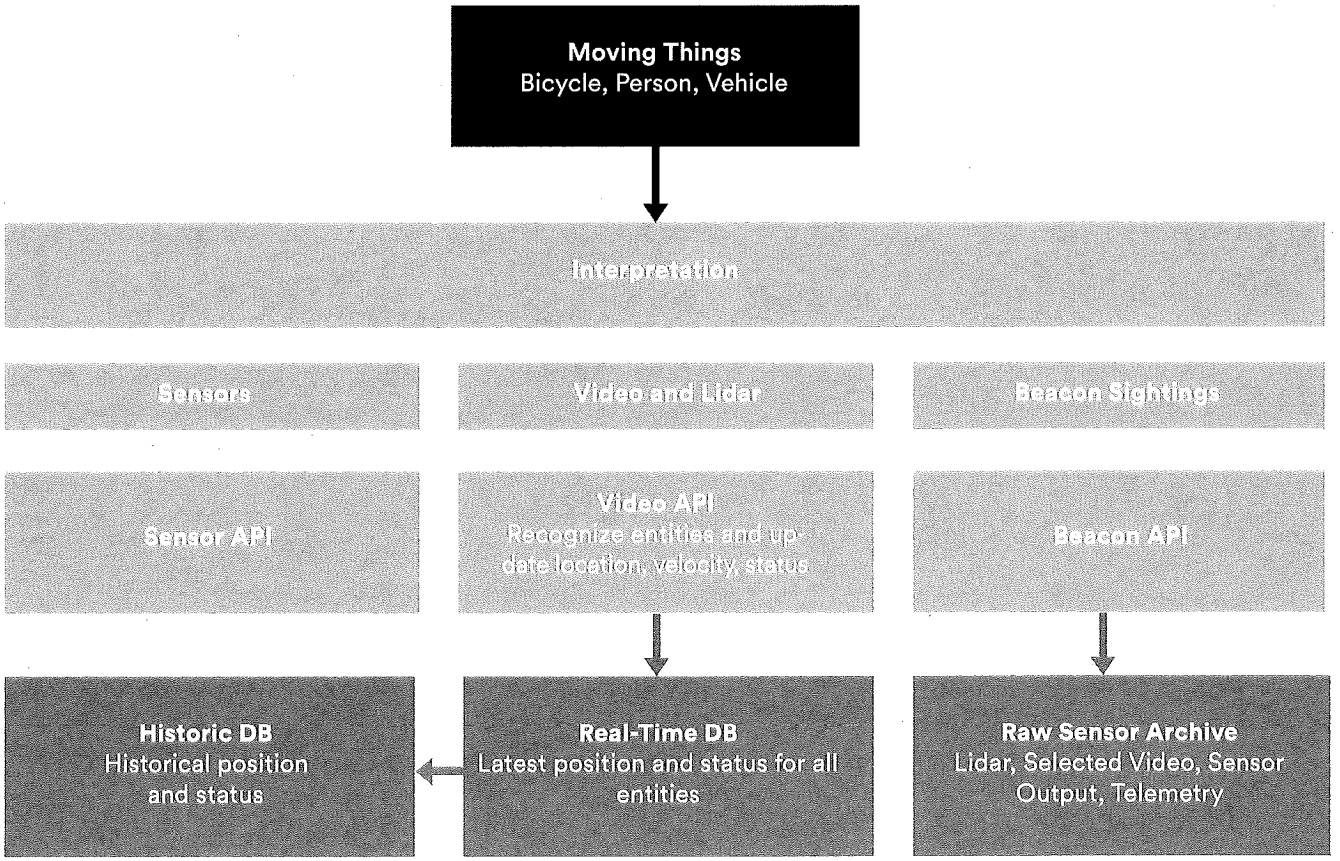
## Modelling

Once fine-grained data are available, it will be increasingly possible to develop a digital model of the performance of the neighbourhood, and use that model to evaluate the effect of various decisions. The ability to predict the consequences of possible interventions, and to refine the model based on measurement of actual outcomes, is an accelerant to improving the livability of the neighbourhood.

To take an earlier example: as Sidewalk experiments with various weather mitigation strategies, it will get real-time feedback on temperature and wind speed from a high-density mesh of sensors. That will enable the real-time evaluation of different interventions. Likewise, when the platform detects pedestrian congestion—for example, during entertainment events—the neighbourhood will have detailed data about where the bottlenecks are occurring and what is causing them. By making use of dynamic signage, flexible street furniture, and guidance from smartphone apps, the platform can experiment with ways to create better pedestrian flow. Even making information available about crowding in real time to residents and visitors will enable them to make informed decisions about when and where to visit locations within the neighbourhood.

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## Sense Interpretation Stack




**Sensor and camera output is interpreted by computer vision and normalization. The resulting data are streamed to a low-latency geospatial database for real-time interventions. It is also recorded to a historical database for later analysis and planning.**

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DIGITAL LAYER

# Model

MANY URBAN INTERVENTIONS ARE DIFFICULT TO TEST in real-world conditions due to cost and customer inconvenience. Model provides a virtual laboratory to experiment with changes in infrastructure, policy, and the built environment. At Model's core is a metro area-scale simulation representing the movement of each person. From these patterns, Sidewalk is able to construct an activity-based model system that can inform and explore a wide range of policy options including in the areas of roadway pricing, ride sharing, zoning and land use, and incentives to conserve water and energy.

Modelling how people make choices about where to live, where to shop, whether to own a car, or how to travel from place to place are key concerns for urban planners. Current demographic, land use, and travel forecasting tools rely on statistical inferences based on sparse and sporadic data. These methods are sufficient if the travel choices are conventional and the travel networks are relatively stable (e.g., a conventional bus route). For Quayside and the Eastern Waterfront, Sidewalk's goal is to dramatically reduce the need for car ownership by offering residents new mobility options, such as shared self-driving vehicles. Since these new options have no operating history, Model will deploy more fundamental and sophisticated inferences to predict demand using machine learning techniques.

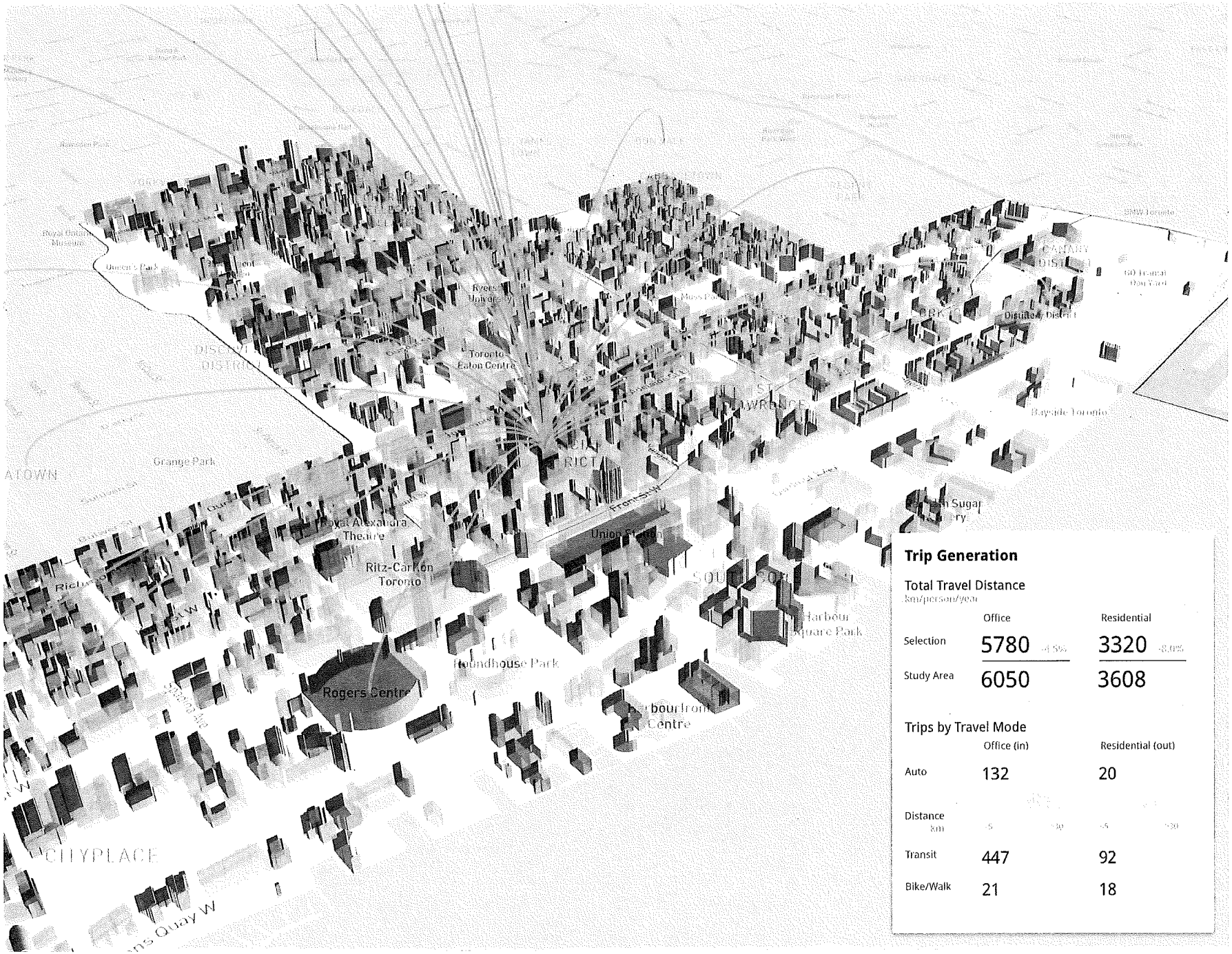
Model can be used in both operational and planning contexts. Combined with data from Sense, Model can provide a robust decision support system by simulating the next 5, 15, or 30 minutes of neighbourhood activity to anticipate problems and suggest remedial measure before they amplify. At weekly and monthly time scales, facility managers can simulate changes to infrastructure and policy to improve operational efficiency. Operational planning blends into medium- and long-range planning, which can be used to design the growth of the neighbourhood and achieve strategic objectives.

In current practice, medium- and long-range planning schemes are considered separately from near-term operational schemes. This creates an unfortunate "open loop" where each schemes fails to benefit from the other. In Quayside, and eventually the Eastern Waterfront, Sidewalk has the ability to align these efforts in order to create a unified framework to serve a wide range of applications. As Model gets exercised daily, its fidelity and accuracy will improve. These improvements will provide long-range planners with more accurate representations of people and behaviour.

Innovators can test concepts in Model's simulation environment to understand their direct and indirect impacts and solicit feedback from the community. Sidewalk believes that this level of transparency and accessibility will enable the neighbourhood to find creative, inclusive solutions faster.

**Model is able to estimate the number of inbound and outbound trips to and from each site. For each trip, it can compute the distance traveled by travel mode.**

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DIGITAL LAYER

# Map

KNOWING WHERE THINGS ARE IN THE PUBLIC REALM allows a neighbourhood to be safe, efficient, and responsive.

For example, efficient mobility relies on knowing where self-driving vehicles are, and safety can be increased by letting cyclists know when there is a danger of collision. Keeping track of public events, and helping people find out what is going on at a glance, will improve people's experience of the neighbourhood. Understanding the patterns of use of parks, roads, and other resources permits better planning.

Map records the location of all parts of the public realm in real time, from the largest buildings to the smallest environmental sensors. This includes the fixed objects—buildings, roads, park benches—and those that move—autonomous vehicles, delivery robots, drones. Map enables people and things to move around the neighbourhood with maximum safety, confidence, and efficiency.

In Quayside, real time information on the environment will flow through Map, producing real-time snapshots of the neighbourhood. This information will directly benefit residents and visitors through its use in applications like Flow, Sidewalk's mobility subsidiary.

# Account

NEIGHBOURHOOD RESIDENTS AND MUNICIPAL STAFF will each have accounts that permit them to interact with the city environment and services. Visitors can also opt to have an account to help them experience the neighbourhood. The account will provide access to places and resources they want to take advantage of. It will also enable them to connect neighbors with each other and with and municipal employees.

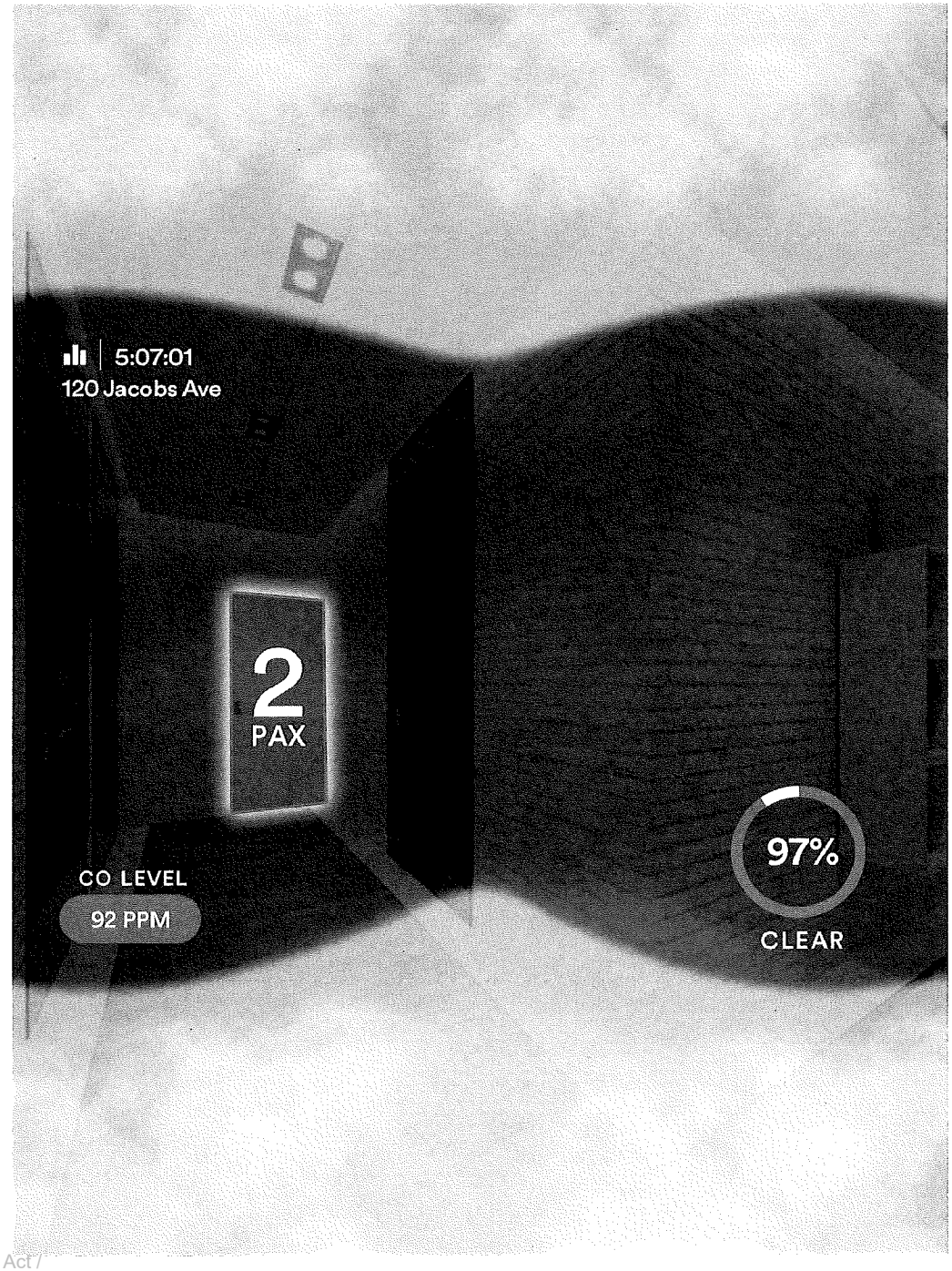
While fine-grained information about the public realm and the objects in it enables greater efficiency and quality of life, it also necessitates a careful approach to authentication and permissions to ensure privacy is maintained and control is appropriately circumscribed. Authentication of people as well as automated processes ensures that the platform can identify those who request access to data or control over physical objects. A universal permissions system can then enforce which information and entities a particular individual has the rights to access or modify.

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## Use Cases: Ordinary Use and Emergency Situations

Examples of Map and Account in action:

- A resident uses his or her account to temporarily grant a maintenance worker access to their front door. The door lock uses Policy and Permissions APIs to retrieve the required confidence threshold to grant entry.
- A car is allowed to use a street segment for a period of time.
- A building superintendent is granted rights to access apartments to conduct repairs.
- The fire department is given access, on emergency basis, to any apartment where a fire alarm is triggered.




**The image at left shows the data that a combination of Sense, Map, and Account could make available to firefighters during a crisis. Emergency-only permissions could grant firefighters unrestricted access to data at a crisis location, assessing the environment and expediting the process of finding people in a harmful situation, while still preventing personally identifiable information from being easily obtained.**

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DIGITAL LAYER

# Roadmap

| Product Development Strategy: | |
|---|---|
| **Sense** | Development of Sense is under way through experimentation with existing sensors, cameras, lidar, radar, and accompanying computer vision and machine learning techniques. Sidewalk plans to deploy these in existing cities—including Toronto, if possible—to establish the right technical approaches, reduce risk, and to start to value engineer the technologies that appear to be promising. |
| **Model** | Sidewalk is investing in the data science research needed to bootstrap a region-wide activity-based model that uses mobile location data. Leveraging the kinds of aggregated, anonymized data that Google has made available through the Better Cities program, Sidewalk's initial model calibration will focus on multimodal transportation, which includes private cars, public transit, private transit, ride-sharing services, bicycle, and walking. Similarly, using census and other open data, Sidewalk is building synthetic populations to support high-fidelity models that enable a significant leap in accuracy and consistency in the state of the art of urban simulation. |
| **Map** | Sidewalk is developing the first version of Map to support the output of Sense experimentation, including analyzing the paths and flow rates of vehicles through intersections and measuring air quality in existing cities. Through Sidewalk's subsidiary Flow, which focuses on mobility, Sidewalk is surveying existing cities—particularly curb space—at high resolution. Likewise, Flow is collaborating with Google to contribute real-time urban information to users via Google Maps. |
| **Account** | Sidewalk is actively investigating existing technologies that support identity and authentication—from commonly used identity systems such as Google and Facebook to sophisticated cryptographic proofs of identity and authorizations. Sidewalk believes, for example, that it will be possible to prove the right to access a particular resource without revealing identity, which reduces the attack surface for the system. We are drawing on Google's significant experience and product thinking in this area to ensure that the permissions system is both easy to use and secure. |

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| Quayside Pilot: | Eastern Waterfront Manifestation: |
| --- | --- |
| Sidewalk will likely deploy a larger range of technologies than strictly necessary in Quayside in order to learn what works best and which applications are most important. The opportunity to integrate these technologies into the urban infrastructure at high density over a significant area will provide opportunities for learning available nowhere else in the world. The sensor network will be responsible for helping to run the neighbourhood from day to day, but will probably involve a higher level of manual configuration and monitoring than if at a larger scale. | Extending this approach to the Eastern Waterfront will create economies of scale in the manufacture, installation, and operation of Sense technologies. The sensors and supporting power and communications networks will have been value-engineered, and the platform supporting the sensors will be tested and ready for scaling. The larger scale will represent real "big data"—where machine learning techniques that work best with massive quantities of measurements will be applicable. These datasets will transform our understanding of urban environments, and will allow us to automatically configure, monitor, and optimize the neighbourhood. |
| Sidewalk will apply the modelling framework to the Toronto region and calibrate it against Toronto's regional travel demand model. Such a regional model, running on Google's Cloud Computing platform, will allow Sidewalk to model the interactions between the neighbourhood and its environs—evaluating many what-if scenarios in parallel. Specifically, Sidewalk can forecast how many neighbourhood-external trips will be generated by "attractors" in the neighbourhood. The same model can be used during the design process to study neighbourhood-internal travel patterns and the relative attractiveness of novel travel modes. As the development team sets the desired population and land-use patterns, the model will update the demand conditions for mobility, services, and infrastructure. | Learning from the Quayside site, Sidewalk can scale its models to work on the larger site using the same tools and methods. At this scale, neighbourhood-internal transportation modelling becomes much more interesting—especially since this is likely to be the first large autonomous vehicle-only district in the world. |
| Quayside will produce orders of magnitude more data about district layout and operation than is available in existing cities. As the master plan and the plans for individual buildings are produced, they will be stored in Map—even before construction. Sidewalk will also add the results of surveys conducted with technology based on Google's Tango platform, which uses stereoscopic and inertial techniques to capture the as-built environment efficiently. During the operation of the Quayside neighbourhood, real-time state information on the environment will flow through Map producing a real-time snapshot and recording historical information for retrospective analytics. | At the Eastern Waterfront scale, Map will be fully realized—the schema will have been expanded to cover the diversity of building types, public spaces, vehicle types, and activities. The size of the neighbourhood will make Map indispensable for navigation and awareness—whereas people will be able to grasp the whole layout of Quayside from macro to micro, Map will be necessary to finding one's way around and discovering what is going on at the other end of the neighbourhood. Similarly, Map's support for the operation of the neighbourhood will require new summary analyses and intelligent alerts to permit efficiencies of scale. |
| Quayside will introduce the concept of a single-login portal to residents, administrators, and visitors. There will be cases where the portal will be critical to providing services in a secure, efficient way. But there will be new uses created by the developers working as part of the urban innovation institute that can't be anticipated. This is where the power of a consistent identity system will begin to emerge—as developers start to take advantage of a preexisting identity and permissions framework that allows them to access resources and perform tasks on behalf of users, innovation will accelerate. | The Eastern Waterfront will be able to take advantage of novel uses developed in Quayside from day one. Developers will have the opportunity to build in many of the experiences and abilities enabled by the Account systems as Sidewalk and its partners design infrastructure and processes in the broader Eastern Waterfront. |

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# Sustainability

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Toronto is a global leader in urban sustainability, and its revitalized waterfront must reflect and advance its environmental ambitions. Sidewalk Labs envisions Quayside as the testing ground for breakthroughs in a broad set of sustainability-related innovations, including energy efficient buildings, electricity management, district heating and cooling, solid waste, and water.

Taken together, these will make Quayside the most greenhouse gas–efficient neighbourhood in North America. And they will set the stage for the Eastern Waterfront to become the first truly climate positive community on Earth.

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# Realizing the Vision for Climate Positive

## An Ambitious but Achievable Approach

Waterfront Toronto's commitment to making the Eastern Waterfront climate positive establishes a high bar. While sustainability targets are easy to set, realizing ambitious goals requires careful planning, diligent execution, and above all a commitment to achieving and reporting progress.

Sidewalk has developed strategies to make Quayside itself nearly climate positive. We believe this is achievable through a set of enhancements to current technology: Passive House buildings with advanced building controls; a flexible thermal grid that draws on multiple sources of green thermal energy; an advanced microgrid both to generate onsite power and to manage power drawn from the grid; and an innovative approach to handling solid waste. In Quayside, many of these solutions will be at their early stages, making the neighbourhood a testing ground for urban innovation.

These innovations will bear fruit when applied at the scale of the Eastern Waterfront. Most importantly, the Eastern Waterfront's scale will allow us to tap three major sources of available thermal energy: the Portlands Energy Centre, the Ashbridges Wastewater Treatment Plant, and Lake Ontario itself. Any one of these would make the Eastern Waterfront Climate Positive; all three will make it a major supplier of clean thermal energy to the rest of downtown Toronto.

C40 CITIES

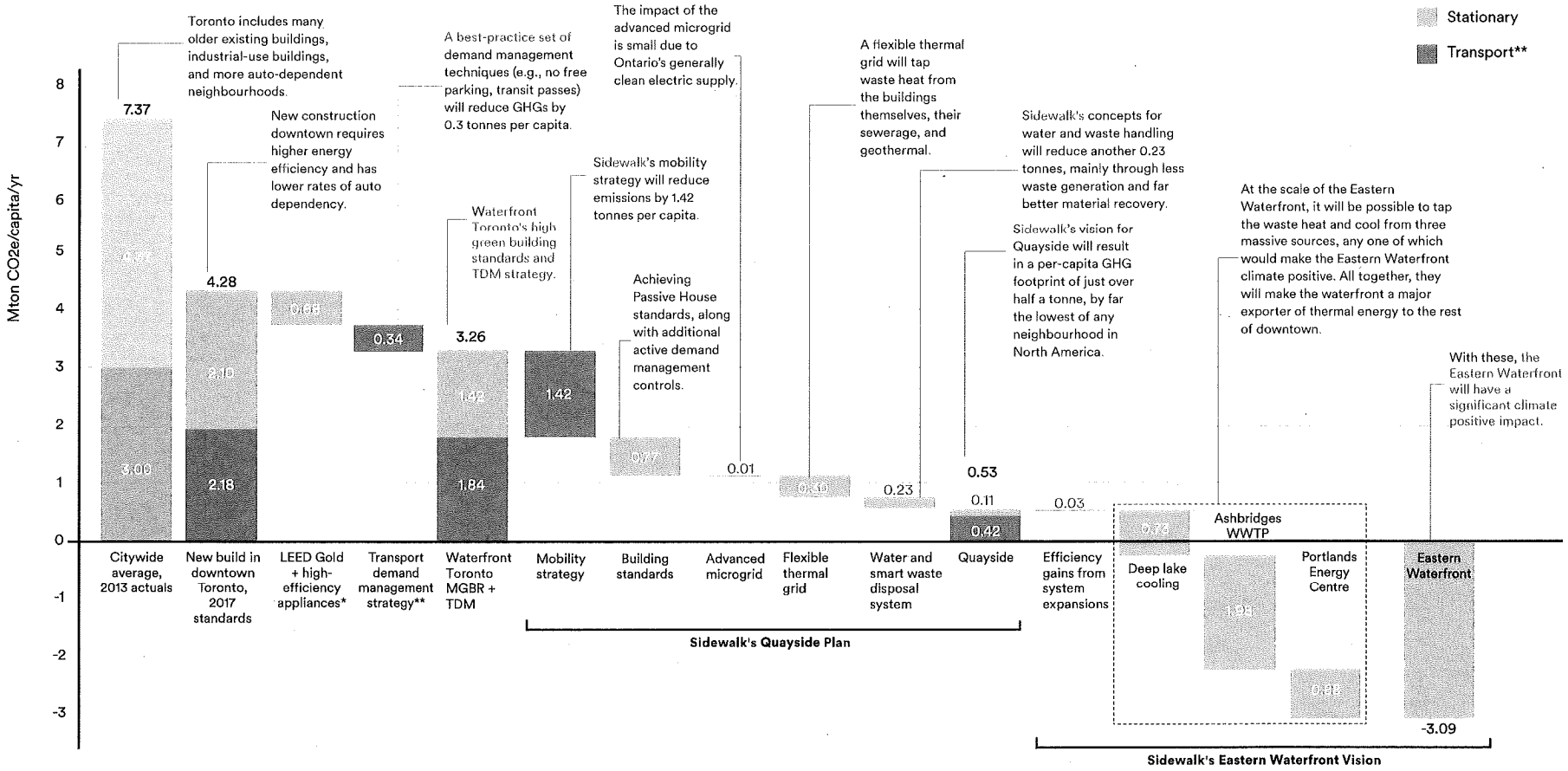


**The sustainable design of the Lower Don Lands park reflects the commitment of Waterfront Toronto to realize its Climate Positive ambitions.**

Credit: C40

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# A Roadmap to a Climate Positive Eastern Waterfront




* Mandated WT LEED Points. Renewable energy production, 5%, 2 points. Optimize energy performance, 50% cost savings relate to MNECB 1997. Peak heat 65% less, peak cool 30% less, relative to MNECB 1997.

** Using residential allocation methods.

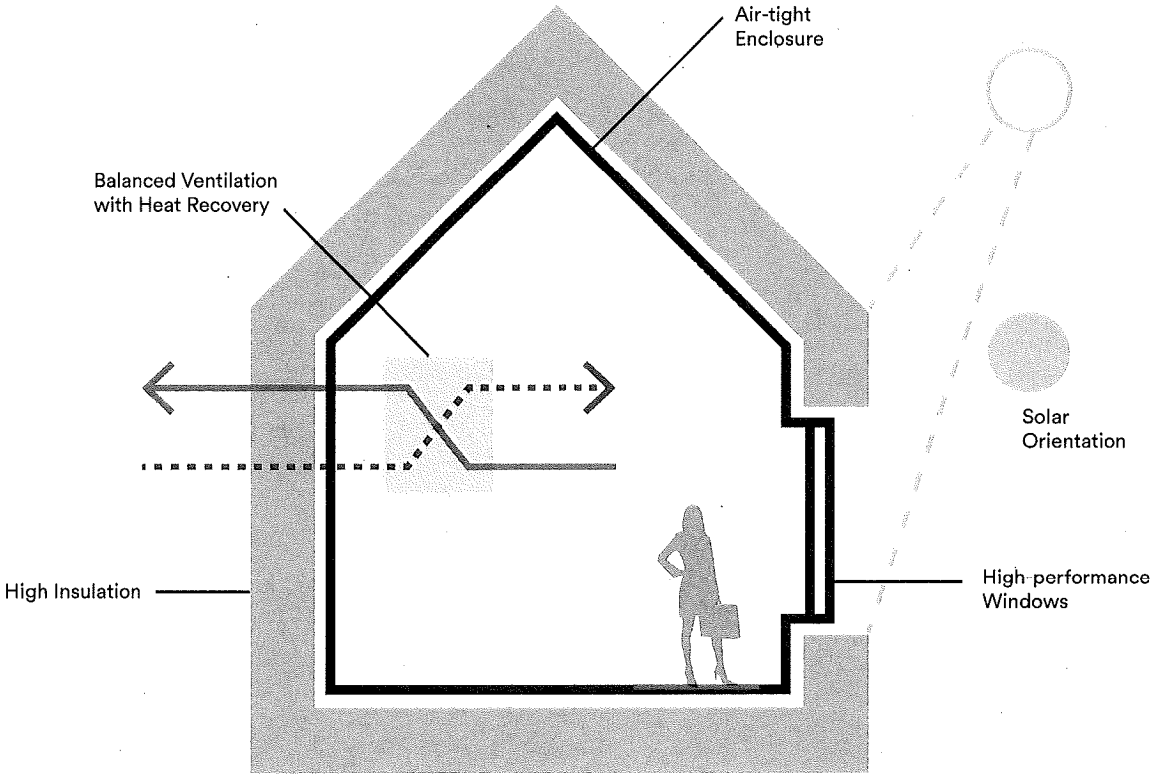
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# Reducing Energy Demand: Building Standards

CORE TO ANY URBAN sustainability strategy is having buildings that are highly efficient. Waterfront Toronto has set a high bar with its Minimum Green Building Requirements, but Sidewalk Labs believes that Quayside can be the largest cluster of large-scale Passive House buildings yet constructed in North America. Combined with advanced demand management, we believe we can reduce building-related energy consumption by 25 percent over the Waterfront Toronto MGBR at a reasonable cost.

## Passive House

The Passive House standard has been much more common in Europe than in North America, although it has recently been applied to a limited number of large-scale buildings here. An older standard than LEED, Passive House is based on a design philosophy rather than a points system. The lessons of one such building, on Cornell University's new Roosevelt Island campus in New York City, inform Sidewalk's thinking here, both in terms of areas that will require innovation and in Sidewalk's confidence that the incremental cost of Passive House will decline significantly if it is deployed in several buildings at once.




**A schematic showing key design features of the Passive House. Core to Passive House is the idea that design should take into account the natural flows of thermal energy, including managing direct solar energy as the seasons change, guiding warmer and cooler air to flow where it is needed rather than simply being vented, and using heat pumps rather than combustion.**

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# LEED vs. Passive House

A key difference between the Passive House and LEED standards is that LEED uses a point system with some mandatory achievements, while Passive House has a limited set of specific energy performance targets and a design philosophy. Passive House energy targets are set based on climate zone; the figures shown here are appropriate for Toronto.

## LEED Gold v4

- Points-based system
- Energy points are awarded from 1 to 10 points for energy cost savings of 10.5% to 42%
- Points for some design choices but all are optional
- Controllability of systems, lighting = 1 point
- Site development, protect or restore habitat = 1 point

## Passive House

- Absolute energy targets, based on climate zone
- Heating load ≤ 10 W/m2, annual heating demand ≤ 15 kWh/m2, annual primary energy demand ≤ 120 kWh/m2, thermal bridging Psi ≤ 0.0, airtightness ≤ 0.60 ACH@50Pa
- Design philosophy to manage heat/cool/light passively
- Maximize solar gains for winter, minimize solar gains for summer
- Keep window sizes smaller to prevent leakage



**At 26 stories, Cornell Tech's residential tower is the tallest Passive House building ever built. It is projected to achieve a 73% reduction in overall energy consumption compared to the median of comparable New York City buildings. Although Passive House added 5-10% to the cost of this building, key cost drivers were identified as sources of future innovation and savings, such as developing new techniques for testing how well the building is sealed.** Credit: Cornell Tech

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# Active Demand Management

## Active Demand Management

Active demand management systems use data to minimize demand. Data, especially predictive information, about the drivers of demand, enable significant tailoring of consumption; this includes pre-warming a building when a day is expected to be cold, or reducing air conditioning on a summer afternoon when calendars indicate that many employees are planning to leave early. Even more significant are smaller-scale interventions, such as room-specific thermostats that drive variable-speed fans to balance temperatures across rooms.

Alphabet's Nest thermostat represents an example of applying computer learning principles to the control of heating and cooling in single-family homes. In a multi-family or office setting, good controls will be applied to HVAC, lighting, computers, and other major sources. While the Passive House standard emphasizes the passive management of thermal energy, a Passive House building's insulation also makes it an excellent candidate for active energy management.

In some cases, active demand management goes well beyond the basic types of occupancy sensors and other systems that many LEED buildings have; it is possible, for example, to have conference room screens "sleep" when a central calendar does not show a meeting scheduled. In other cases, the thermal inertia that is designed into a Passive House building makes it an excellent candidate for highly intelligent building management, such as pre-heating and pre-cooling during off-peak hours based on temperature predictions for the subsequent day.

Overall, the potential for active energy savings in a Passive House structure actually exceed the savings over Waterfront Toronto's MGBR, and many of these active savings opportunities would not be available without the Passive House design.




### Electricity Consumption of a Mid-sized Passive House Office Building and Impact of Active Controls

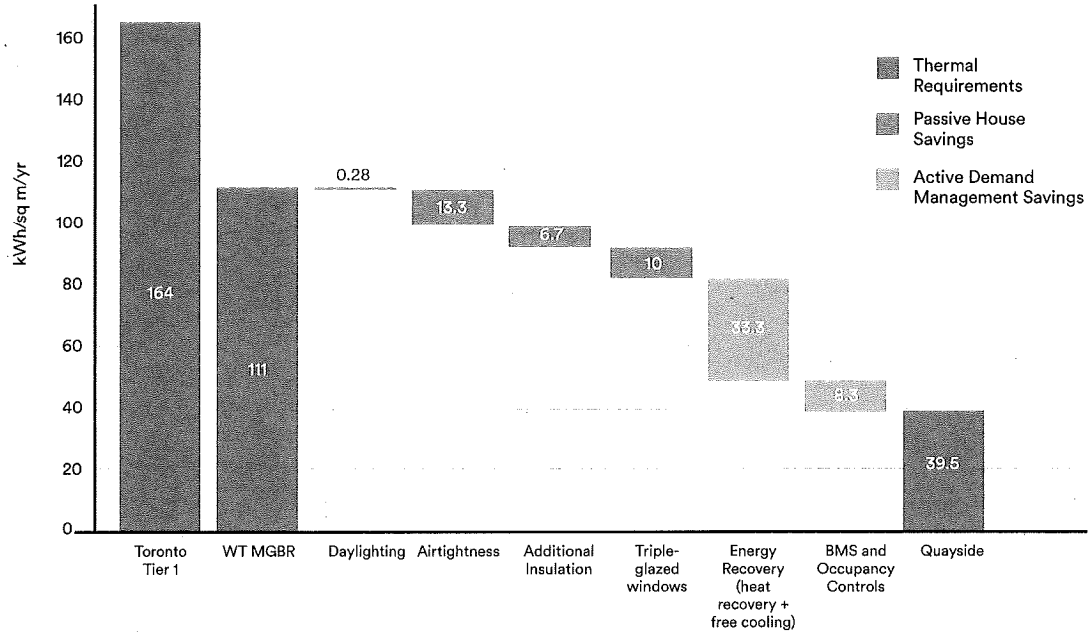
| Electrical Load | % of Total | Impact | Control |
|---|---|---|---|
| HVAC | 25% | High | Occupancy sensors, compensation with outdoors |
| Lighting (Overhead) | 16% | High | Occupancy sensors plus natural lighting |
| Lighting (Task) | 3% | Medium | Occupancy sensors |
| Kitchen Appliances | 7.5% | High | Power up/down based on occupancy |
| Desktop Computers and Monitors | 9.5% | High | Predict powering up/down based on occupancy patterns |
| Laptops | 6.5% | Low | Designed for minimum drain |
| Printers/Copiers + Conference room screens | 19% | High | Predict powering up/down based on occupancy patterns |
| Other | 14.5% | n/a | Other features designed for minimum drain |

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## Thermal Savings

Given the variability of the climate, thermal energy is the largest aspect of energy demand for buildings in Toronto, and the focus of Passive House design thinking. Between Passive House design and active demand management, Sidewalk Labs expects to reduce thermal energy demand by more than 64 percent of the Waterfront Toronto MGBR. The largest single area of potential is in actively managing the thermal energy that Passive House design keeps within the building, an exciting potential synergy between these two approaches.

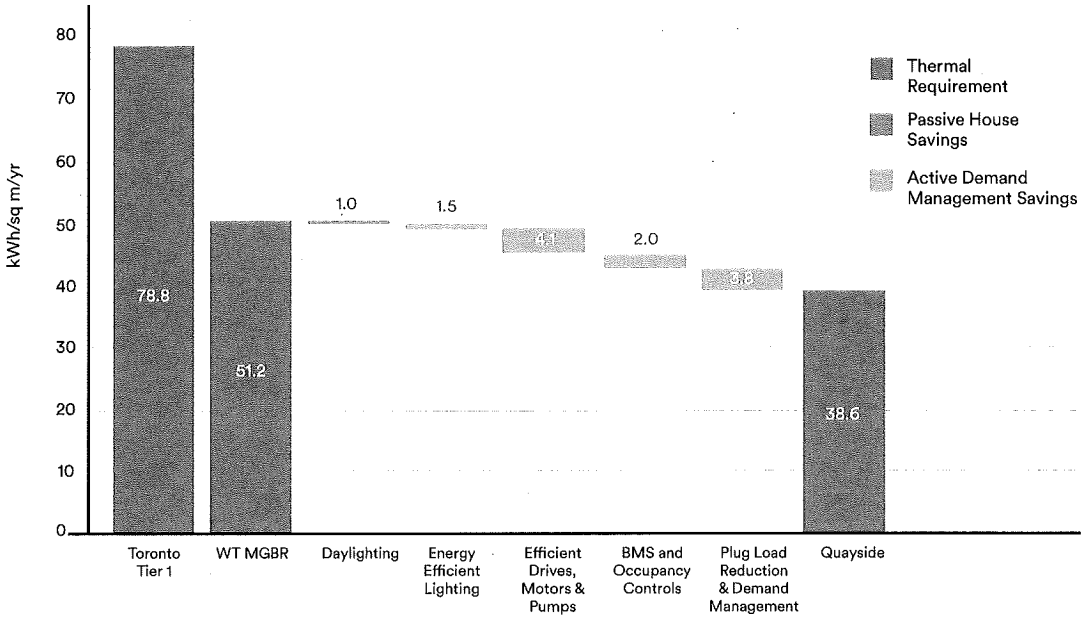
Passive House and Active Demand Management Thermal Savings (per sq m)




## Electric Savings

Electric demand is only one-third of the overall demand of either a Tier 1 or an MGBR building. Although we expect another 25 percent reduction based mainly on active demand management, much of the remainder is the plug load, which is difficult to reduce further, as it comprises the computers, appliances, and other systems that serve the users of the buildings.

Passive House and Active Demand Management Electricity Savings (per sq m)



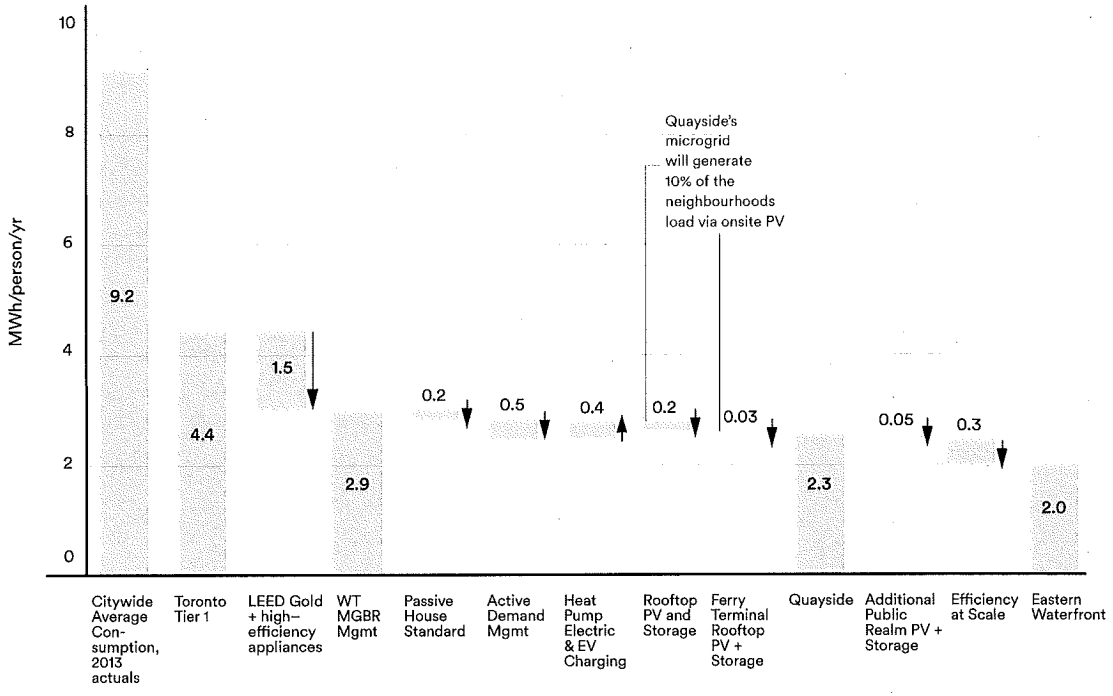

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# Providing Clean Energy: Advanced Microgrid

AS THE PRICE OF photovoltaics continues to decline, the key constraint on increasing onsite renewable generation in urban environments is less about cost and more about grid interactions. This is because it is still impossible to power multi-storey buildings entirely from onsite power generation, and that problem is not expected to be solved in the foreseeable future. To innovate around this challenge, Sidewalk envisions Quayside as a place where a combination of onsite generation, onsite storage, and inter-building trading creates a microgrid that maximizes onsite generation, minimizes the greenhouse gas footprint of imported electricity, and reduces the stress that large amounts of solar power may put on the surrounding electric grid.

Waterfront Toronto has set an ambitious goal that onsite renewable power generation meet at least 10 percent of annual electricity demand. We believe this will be achievable with 50 percent of the roof space, so that the remainder can be used for green roofs. Depending on the site plan, and the evolution of technology, façade-integrated PV may also be feasible. However, given how clean Ontario's grid is during off-peak hours, adding battery storage and managing the system to optimize when it draws electricity from the grid is likely to be the most environmental and economic approach to providing clean electricity supply for Quayside and the Eastern Waterfront.

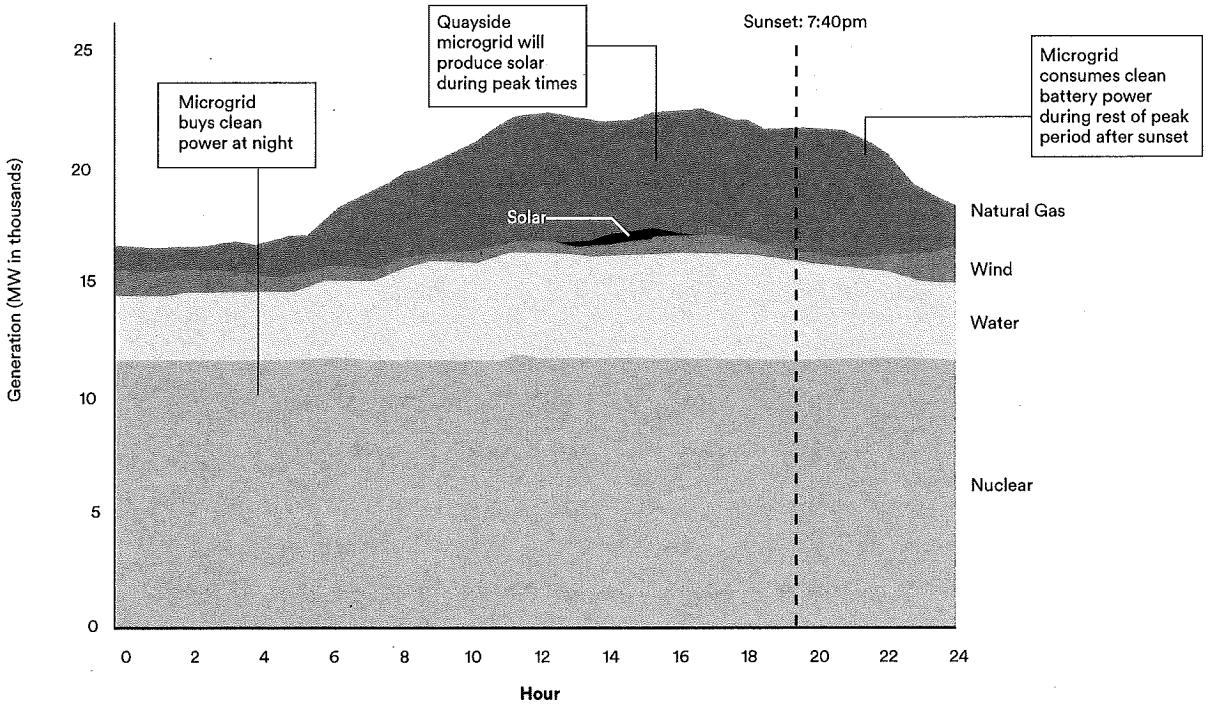
## Per Capita Electricity Consumption from the Grid




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# Managing a Microgrid to Lower Emissions and Costs

The microgrid uses solar and battery storage to store, generate, and consume power when it is cheapest and cleanest.




**This graph shows Ontario's electricity demand curve on September 7, 2016 using data sourced from the Ontario Ministry of Energy.**

To manage the microgrid efficiently, a local independent system operator (ISO) will use cutting-edge software and smart metering technology installed throughout Quayside to balance electricity supply and demand seamlessly between buildings and manage trading with the wholesale market. The local ISO will maximize Quayside's economic and carbon efficiency, as well as ensure that its onsite generation does not cause any disruption to Toronto Hydro's grid stability.

The ISO will dispatch clean power stored in the microgrid's batteries to avoid peak costs and lower Quayside's emissions factor. In the summer, the ISO will buy power at night from the grid when it is relatively cheap and clean, and store it in batteries to be consumed during the hours of peak demand when electricity from the grid is dirtiest and most expensive. When the sun begins to set and demand from the grid steeply increases, referred to as the "duck curve," the ISO will smooth out the curve by gradually dispatching excess stored solar energy as the sun goes down. Finally, when the power goes out, the ISO will disengage from the grid and distribute Quayside's onsite generation where it is needed most.

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# Flexible Thermal Grid

AS HOME TO ENWAVE'S DEEP LAKE COOLING system, Toronto is already a user of one of the most innovative district energy systems in North America, and both the city and Waterfront Toronto have strongly endorsed expanding district heating and cooling as a sustainable approach to providing the thermal energy that Toronto's climate demands. Most district energy systems focus on capturing thermal energy from one reliable source of heat or cool; to the extent that source is variable, they usually rely on mechanical chillers or boilers to compensate for the times when it is unavailable. This makes all district energy systems somewhat reliant on fossil fuels, and also prevents such systems from tapping large but highly variable sources of energy.

As Waterfront Toronto's innovation partner, Sidewalk will organize the development of a truly flexible "thermal grid." The thermal grid will capture heat and cool from multiple sources, balance it in a thermal energy centre, and distribute it to buildings via hot and cold water pipes, just as the energy grid taps multiple sources of electricity generation and manages the electric grid to match demand. But since its main components are a hot-water tank and a cold-water tank, a thermal energy centre will not be a dangerous or noxious land use, making it far easier to site than most electrical facilities.

In Quayside, the system will draw on ground-source heat and cold pumps, sewage generated by the neighbourhood itself, and the anaerobic digester envisioned as part of the neighbourhood's waste system. The system will also include a return loop, which will effectively capture waste heat and cool from the participating buildings themselves.

The tremendous advantage of a flexible thermal grid will be realized most fully at the Eastern Waterfront scale. Two massive sources of waste heat exist in and near the waterfront: the Portlands Energy Centre power plant (PEC) and the Ashbridges Wastewater Treatment Plant (WWTP). Traditional district energy systems would have difficulty using these sources, because their output is highly variable. As a peaker plant, the PEC only operates about a quarter of the time; the sewage flowing into the Ashbridges treatment plant is generally warm but its temperature varies during rainfall and snowmelt due to Toronto's combined sewer system. Thanks to the grid-management impact of the proposed central thermal-balancing centres, and the reliable heat thrown off by the neighbourhood's own sewage and ground-source heat pumps, the heat from these two facilities can be captured, saving tremendous amounts of fossil fuel consumption.

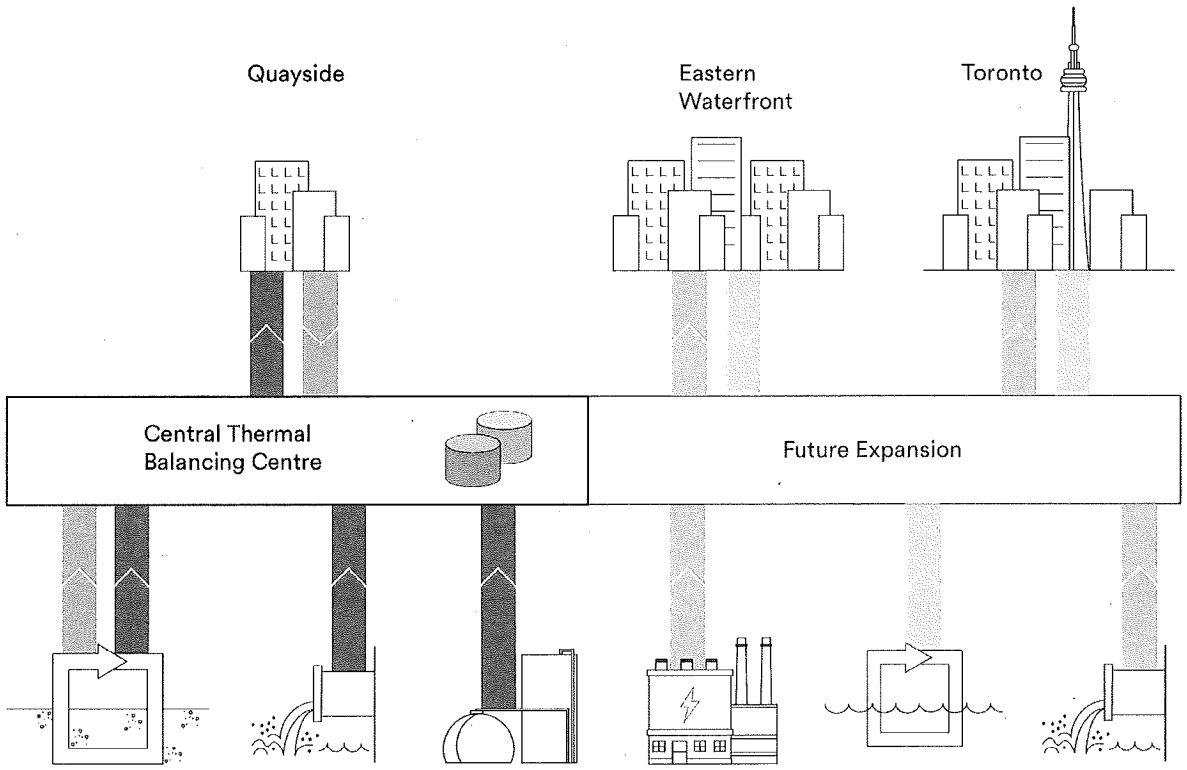
The Eastern Waterfront also provides the scale necessary to finance the construction of a new Deep Lake Cooling system. Although such a system does not require a flexible thermal grid, thanks to the lake's layer of reliably cold water, the capital investment necessary will require a committed user base much larger than Quayside.

Any one of these three sources would generate far more thermal energy than the Eastern Waterfront actually needs, and thus could be exported to the rest of Toronto. If all three sources were tapped as part of the Eastern Waterfront, it would have the potential to cover a large portion of downtown Toronto's thermal energy needs.

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# Multiple Sources of Reusable Thermal Energy

Several sources of thermal energy are available at both Quayside and Eastern Waterfront. However, the scale of the Eastern Waterfront allows us to tap the tremendous potential of three sources: the PEC, Lake Ontario, and Ashbridges Wastewater Treatment Plant.




| | Ground Source | Sewage | Anaerobic Digester | PEC | Lake Ontario | Ashbridges WWTP |
|---|---|---|---|---|---|---|
| **Quayside Technical Potential (MWh)** | 10,792 | 1,854 | 1,784 | n/a | n/a | n/a |
| **Eastern Waterfront Technical Potential (MWh)** | 119,814 | 56,203 | 20,745 | 400,000 | 1,250,790* | 900,000 |

*Assumes a new facility sized similarly to the current Enwave Deep Lake system.

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# Managing Solid Waste Wisely: Smart Disposal Chain

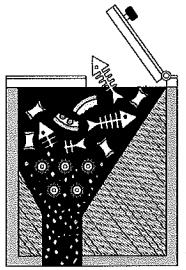
## Waste Strategy

Toronto's 2016 solid waste management plan set a citywide waste reduction target of 70 percent diversion of recyclables and organics by 2026, and Waterfront Toronto is set to meet that goal in future developments. Sidewalk proposes managing waste to meet the target with four main strategies that will exceed Waterfront Toronto's standards. First, organic waste macerators will be incorporated into every kitchen, creating a direct and easy way to separate out organics; this will feed into the waste system rather than the sewer system (which is prohibited in Toronto). Second, pay-as-you-throw (PAYT) incentive structures will be implemented in multi-family residences, incentivizing lower waste-generation rates and enabling three-bin separation where traditionally diversion rates have been low. Third, trash will be transported below ground in dedicated utility channels, reducing the traffic impact of collection and lowering associated emissions. Lastly, local recovery and processing of organic waste will be provided, enabling the collection of the methane from the digestion process to generate heat for the thermal grid. Overall, Sidewalk expects a reduction of landfill waste of more than 90 percent, with much of that coming from waste reduction and anaerobic digestion, two of the most environmentally beneficial approaches to waste reduction.

| | Current Toronto Diversion Rate | Sidewalk Projected Diversion Rate |
|---|---|---|
| Single Family | 66% | n/a |
| Multi-Family | 26% | 90% at minimum |
| Industrial, Commercial, Institutional | 13-18% | 90% at minimum |

## Solid Waste System

The solid waste system Sidewalk imagines has four components: (1) organics disposal units, conveniently located in every kitchen and office; (2) chutes for inorganics that scan and charge for what is disposed; (3) a waste haulage system that relies on autonomous vehicle technology; and (4) recovery centres to aggregate and process waste.



①

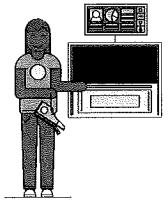
**Organic-waste macerator**

**Every commercial and residential kitchen will have macerators that grind, dilute, and pipe organic waste to a waste container in the basement utility channels.**

②

**Smart chute**

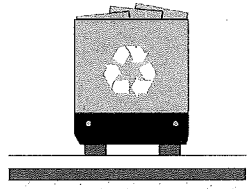
**The smart chute uses digital technology to implement PAYT in multifamily buildings, leveraging research that shows that accountability and payments drive down waste generation and increases recycling. A next-gen version will verify and sort disposals by recycling category.**

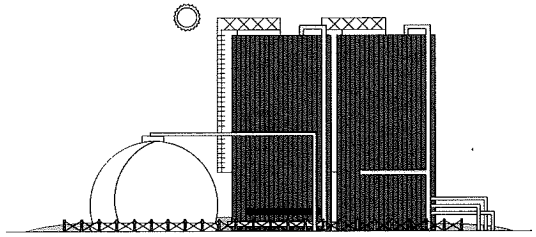


③

**Autonomous waste transport**

**Industrial autonomous pallets will facilitate solid waste removal within utility channels that connect every basement to central facilities.**





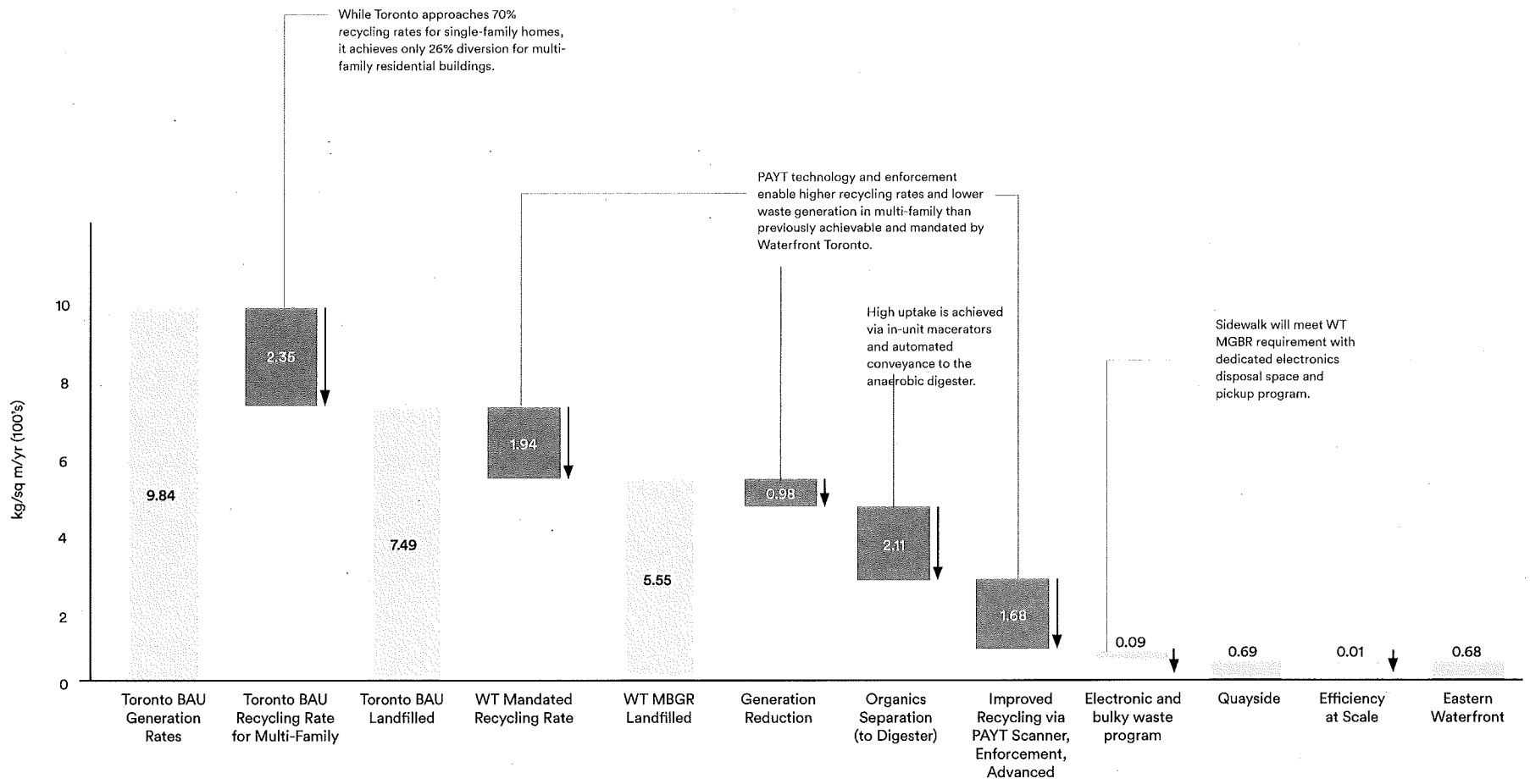
④

**Recovery Centres**

**In Quayside, an anaerobic digester will accept containerized organic waste and process it onsite. At the scale of the waterfront, an onsite materials recovery facility is feasible.**

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# Annual Waste Diversion to Landfill




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# Roadmap

| | Product Development Strategy: |
|---|---|
| **Building Standards** | Sidewalk will leverage expertise in developing large-scale North American Passive House projects to pilot an innovation agenda for buildings likely to include new approaches to testing seals and managing thermal exchanges between rooms and across multiple floors. Sidewalk will also work with Passive House Canada to explore standards appropriate to the innovative building designs that Sidewalk envisions (e.g., modular construction). |
| **Active Demand Management** | Sidewalk will initiate the development of building control products for the multi-family market, including exploring potential partnerships with Nest and similar companies. |
| **Advanced Microgrid** | Sidewalk will identify a proposed microgrid project, likely in Ontario or New York State, to use as a test bed for software developed to optimize the internal trading of electricity across the grid and utilization of onsite storage to optimize power drawn from the grid. |
| **Thermal Grid** | Sidewalk will partner with an established district energy firm to co-develop a flexible thermal grid. This will likely involve developing or optimizing existing software to accommodate the smooth integration of multiple intermittent thermal loads as well as reimagining the design of the thermal energy centre. |

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| Quayside Pilot: | Eastern Waterfront Manifestation: |
| --- | --- |
| Sidewalk will seek to use Passive House, or an equivalent standard, as its basis for buildings constructed within Quayside. In cases of non-traditional construction techniques, Sidewalk will work with Passive House Canada to develop viable alternatives if and when existing Passive House standards prove not to be viable for those types of innovative construction. | Based on the learnings from Quayside, Sidewalk will refine the building standards. The objective of Passive House on the Eastern Waterfront will be reach Passive House standards at less than a 1 percent cost premium to traditional construction. |
| Sidewalk will implement demand management systems and mandate standards for active demand management, which will incorporate into all buildings a data-reporting system compliant with Waterfront Toronto's requirements. | Sidewalk will refine and expand on active demand management systems developed for Quayside to improve performance and standards across buildings in the Eastern Waterfront. |
| Sidewalk will implement an advanced microgrid within Quayside, including the requisite software to manage the exchange and storage of electricity on the microgrid and optimize the electricity purchased from the main power grid. | The Eastern Waterfront will include a large microgrid using technology evolved from the Quayside microgrid. Quayside will be integrated into this new, larger microgrid. |
| Sidewalk will implement a flexible thermal grid, including at least one neighbourhood-scale thermal energy centre. The system will draw from local sewers, ground-source heat pumps, an onsite anaerobic digester, and waste heat/cool flows from the buildings themselves. | Sidewalk and its thermal energy partners will construct a new deep lake cooling centre and will undertake a project to capture waste heat from the Portland Energy Centre and the Ashbridges treatment plant. Critical to the financial success of these ventures will be the extension and integration of the thermal grid into adjacent parts of Toronto so that excess thermal energy can be economically delivered beyond the Eastern Waterfront. |

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# Roadmap

## Product Development Strategy:

| | |
|---|---|
| **Smart Disposal Chain** | Sidewalk will implement the smart disposal system in Quayside, including macerators in kitchens, smart chutes with PAYT capability for inorganic waste, a robot-powered waste movement system, and an onsite anaerobic digester at either the neighbourhood or the building scale. |
| **Utility Channels** | Sidewalk will develop the ideal design for the utility channels, including pathways for robot delivery and waste haulage. |

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| Quayside Pilot: | Eastern Waterfront Manifestation: |
| --- | --- |
| Sidewalk will develop phase one of the "smart chute" as an internal product development effort. It will partner with existing industrial robotics firms to assess the requirements for a waste transport system, and will likely develop the standard container appropriate to building-generated waste (both organic and solid) internally. It will develop a partnership with a proven neighbourhood-scale anaerobic digester producer. | Sidewalk will expand the smart disposal system across the Eastern Waterfront. Smart chutes will identify types of waste and sort recyclables at the point-of-throw. Due to the scale of the Eastern Waterfront, an advanced materials recovery facility will operate on the Eastern Waterfront, separating waste and shipping separated reusable materials to users. |
| Sidewalk will implement utility channels throughout Quayside. Channel design will be tested across a variety of criteria to further optimize the design and concept. | Utility channels based on the Quayside design and updated to include learnings from Quayside will be deployed across the Eastern Waterfront. |

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# Assumptions and Figures Used to Estimate GHG Emissions

## Overall Assumptions:

Energy, water, and waste values are calculated by multiplying an assumed building gross floor area for each land-use type by the generation value (e.g., Energy Use Intensity, Waste Generation Intensity) for that land use. Carbon emissions are calculated based on the total energy (electricity and thermal), water, and waste consumption, multiplied by the respective carbon coefficient. Data based on a conjectural full-build Quayside population of 7,482.

| Category | Sources and Assumptions | Values |
|---|---|---|
| **Citywide Average** | | |
| Buildings (and Waste) GHGs | Toronto's 2013 Greenhouse Gas Inventory | GHGs: 12,205,605 mtons<br>Population: 8,383,396 |
| Transport GHGs | Toronto's 2013 Greenhouse Gas Inventory | GHGs: 8,383,396 mtons<br>Population: 8,383,396 |
| **New Build in Downtown Toronto** | | |
| Buildings Area | Sidewalk's Program (sample) | Quayside:<br>Total: 468,637 sq m (76% residential, 18% commercial/office, and 6% retail) |
| Building Energy Use | The EUIs for Toronto Green Standard Tier 1 (2015)—a 15% improvement over 2012 Ontario Building Code | Residential: electric (83 kWh/m2/yr), thermal (177 kWh/m2/yr)<br>Commercial: electric (66 kWh/m2/yr), thermal (124 kWh/m2/yr)<br>Retail: electric (36 kWh/m2/yr), thermal (115 kWh/m2/yr)<br>Social: electric (95 kWh/m2/yr), thermal (122 kWh/m2/yr) |
| Water | City of Toronto Water Efficiency Plan (use and residential composition);<br>Ontario sewer codes (use for non-residential)<br>Non-residential composition values derived from AWWARF | Residential: 221 LPPD<br>Commercial: 4 L/m2/day<br>Retail: 5 L/m2/day |
| Water-Related Energy Use | Energy for water treatment and wastewater treatment (Water Use Model for Quantifying Environmental and Economic Sustainability Indicators. Journal of Water Resources Planning and Management) | Water: 700 kWh/ML<br>Wastewater: 820 kWh/ML |

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| Category | Sources and Assumptions | Values |
|---|---|---|
| **New Build in Downtown Toronto (continued)** | | |
| Waste | City of Toronto residential generation values and diversion rates (Final Long Term Waste Management Strategy) | Residential: 1.12 kg/hh/day (assumption of 71.1 sq m per hh)<br>Residential (multi-family) diversion: 26% |
| | Non-residential generation and composition derived from CalRecycle | Commercial: 0.0267 kg/m2/day<br>Retail: 0.026 kg/m2/day<br>Institutionial, Commercial, Industrial diversion rate: 18% |
| Transport | Sidewalk's analysis for trips | 13 km vehicle/trip |
| | Trip distance | 6.5 km public transit/trip |
| | Mode split | Car driver (33%), Car Passenger (8%), Public Transport (34%), Active Transport (20%), Other (5%) |
| | Residential trips | Trips by residents: 17,771/day |
| | Total trips | Total trips: 45,974/day |

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# Assumptions and Figures Used to Estimate GHG Emissions

| Category | Sources and Assumptions | Values |
|---|---|---|
| **New Build in Downtown Toronto (continued)** | | |
| Carbon Dioxide Equivalents | Emission Factor for electricity - Environment Canada. National Inventory Report: Greenhouse gas sources and sinks in Canada.<br><br>Environment Canada and Natural Resources Canada. "Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions: 2005 Update Final Report, Contract No. K2216-04-0006". Waste GHG Calculator Emission Factors. October 2009<br><br>Passenger vehicle emissions (source: EPA)<br>Transit (kWh/km for San Francisco streetcar using TTC Flexity streetcar weight difference. TTC car is ~8x heavier) | Electricity: 50.1 g/kWh<br>Thermal (gas): 189 g/kWh<br><br>Waste Landfill: paper (0.240 mton CO2eq/mtonnes waste), food (0.830 mton CO2eq/mton waste)<br><br>Waste AD: food (-0.23 mton CO2eq/mtonnes waste), yard: (-0.26 mton CO2eq/mton waste)<br><br>Passenger vehicle emissions: 417 g CO2e/mile, 21.6 mpg<br>Transit: TTC Flexity streetcar 67.597 kWh/km, 50.1 gCOe2/KWh (electricity grid power), 3,386.60 g CO2e/km, capacity of streetcar 251 people |
| **LEED Gold+High Efficiency Appliances** | | |
| Buildings Energy | Strawman assumption: 38,778 m2 of rooftop available<br>Reductions are based on best practice based and previous WT MGBR | 50% of roof cover solar photovoltaic<br>35% reduction from Toronto Green Standard Tier 1 |
| Water | Strawman assumption: 38,778 m2 of rooftop available<br>Precipitation: Canadian Climate Normals. Environment Canada (95% rooftop runoff coefficient)<br>Reduction values were based on water fixture calculations and best practice.<br>Rainwater harvesting values based on precipitation, roof area, and runoff coefficients. | 33% reduction from low-flow fixtures and efficient appliances, 10% rainwater harvesting from the roof, and no potable water for irrigation.<br>Precipitation: 842.3 mm/yr |

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| Category | Sources and Assumptions | Values |
|---|---|---|
| **LEED Gold+High Efficiency Appliances (continued)** | | |
| Waste | 5% reduction due to waste generation reduction, 41% of recyclables and organics, and 50% of additional electronic and bulky waste diverted | 5% reduction due to waste generation reduction, 41% of recyclables and organics and 50% of additional electronic and bulky waste diverted |
| Carbon Dioxide Equivalents | Emission Factor for electricity - Environment Canada. National Inventory Report: Greenhouse gas sources and sinks in Canada.<br><br>Environment Canada and Natural Resources Canada. "Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions: 2005 Update Final Report, Contract No. K2216-04-0006". Waste GHG Calculator Emission Factors. October 2009 | Electricity: 50.1 g/kWh<br>Thermal (gas): 189 g/kWh<br><br>Waste Landfill: paper (0.240 mton CO2eq/mton waste), food (0.830 mton CO2eq/mton waste)<br><br>Waste AD: food (-0.23 mton CO2eq/mton waste), yard (-0.26 mton CO2eq/mton waste) |
| **Transport Demand Management (TDM) Strategy - Transit Passes, Car Share, Bike Share, Limited Bike/Pedestrian Improvements** | | |
| Transport | Sidewalk's analysis<br>Mode split | TDM<br>Car Driver (28%), Car Passenger (6%), Public Transport (33%), Active Transport (29%), Other (4%) |
| | Residential trips | Residential trips: 17,771 per day |
| | Total trips | Total trips: 44,932 |

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# Assumptions and Figures Used to Estimate GHG Emissions

| Category | Sources and Assumptions | Values |
|---|---|---|
| **Sidewalk's Mobility Strategy:** Transit Extensions, Shared Ride And Mobility-As-A-Service, Parking Management, Pedestrian Links Across The Gardiner Expressway, Assumes 60% Of Auto Trips Are Car-Share Evs, Remainder Consistent With 20% Car Ownership | | |
| Transport | Sidewalk's analysis<br>Change in mode split | Mobility<br>Car Driver (17%), Car Passenger (5%), Public Transport (34%), Active Transport (31%), Other (13%) |
| | Change in total trips | Trips: 44,932 |
| | Transition of all residential trips to electric vehicles (no additional carbon hit) | Residential trips: 2,636 |
| **Sidewalk's Building Standards** | | |
| Building Energy Use | Passive House standards were assumed for all buildings.<br><br>A parametric analysis process was built to calculate heating and cooling energy demand in Quayside. The modelling allows the potential for energy sharing to be evaluated over the course of a typical year. In this setup, a proportion of heating demand will be met using heat recovery chillers and a proportion of the cooling demand could be met using free cooling at a given point in time.<br><br>Conditioning demand was modelled based upon zonal gains simulated using IES energy modelling software. An Excel model was built to calculate the variation in heating and cooling demand. The use of a parametric Excel-based approach builds upon the reliable energy calculations performed in IES. The model assumed Model National Energy Code of Canada for Buildings (MNECB) +25% as the baseline. Best-practice assumptions were assumed for plug loads and lighting reductions. | **Electric:** daylighting (2% reduction from Waterfront Toronto MGBR), energy efficient lighting (3% reduction from WT MGBR), variable-frequency drives and efficient motors/pumps (8% reduction from WT MGBR), BMS and occupancy controls (4% reduction from WT MGBR), plug load reduction and demand management (8% reduction from WT MGBR)<br><br>**Thermal:** daylighting (0.25% reduction from WT MGBR), airtightness (12% reduction from WT MGBR), additional insulation (6% reduction from WT MGBR), triple-glazed windows (9% reduction from WT MGBR), energy recovery (30% reduction from WT MGBR), BMS and occupancy controls (7.5% reduction from WT MGBR) |

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| Category | Sources and Assumptions | Values |
|---|---|---|
| **Sidewalk's Advanced Microgrid** | | |
| Electric Energy | PV array: Assumes 17% efficient panel | 19,389 m2 of roof area (50% roof area) and an assumed 1,550 sq ft ferry–terminal canopy (or canopy on waterfront facility in the public realm) area available at 180 kWh/m2 of roof area |
| **Sidewalk's Flexible Thermal Grid** | | |
| Thermal Energy | Sewage Heat: (from various sources including SHARC, ThermWin, TubeWin, Rabtherm, PKS-Thermpipe, etc. manufacturer data)<br>Geothermal: Engineering assumptions BH (field tests required to verify)<br>Radiant Snowmelt System: Engineering assumptions BuroHappold<br>Anaerobic Digester: Engineering assumptions BuroHappold | Sewage Heat (from SHARC manufacturer data): small system (0.96 kW(heat)/gpm at 220 gpm with COP of 5)<br>Geothermal: energy pile systems (20W/ft at 100 ft per borehole, COP of 4, boreholes in Quayside (924)<br>Radiant Snowmelt System: (0.51 BTU/lb @1°F (to 32°F), 144 BTU/lb @1oF (after 32°F), 0.625 lb/inch of snow) |
| | Electricity of heat pumps and pumps subtracted as penalty (different heat pump COPs used) | Anaerobic Digester: 100 m3 of biogas generated per tonne of food waste |

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# Assumptions and Figures Used to Estimate GHG Emissions

| Category | Sources and Assumptions | Values |
|---|---|---|
| **Sidewalk's Water and Smart Waste Disposal System** | | |
| Water | Strawman assumption: 38,778 m2 of rooftop available, 18,725 m2 of hardscape<br><br>Precipitation: Canadian Climate Normals. Environment Canada (95% rooftop runoff coefficient)<br><br>Reduction values were based on water fixture calculations and best practice.<br><br>Rainwater harvesting values based on precipitation, roof area and runoff coefficients.<br><br>Blackwater recycling (Eastern Waterfront) based on wastewater generated and potentially available after treatment at Ashbridges (additional non-potable water is available from city sources) | 40% reduction from low–flow fixtures and efficient appliances<br><br>100% leak reduction<br><br>95% rainwater harvesting for reuse and no potable water for irrigation<br><br>100% blackwater recycling in Eastern Waterfront |
| Waste | Generation reduction based on best–practice waste programs and source reduction programs<br><br>Organic waste removed from waste stream via macerator<br><br>Recyclables removed from the waste stream via separation due to PAYT (real-time charge and enforcement maximizes separation of recyclables for Quayside; future optical scanner ensure a minimum 90% separation)<br><br>Electronic, hazardous, and bulky waste room in buildings to remove these from the waste stream | 15% reduction due to waste generation reduction<br><br>92% of recyclables and organics diverted<br><br>90% of additional electronic and bulky waste diverted |

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| Category | Sources and Assumptions | Values |
|---|---|---|
| **Efficiency gains from scale** | | |
| Buildings Area | Based on the assumed diversity of mix of Eastern Waterfront compared to Quayside (i.e., increased mix of uses) | Total (Eastern Waterfront): 7,803,933 sqm (46% residential, 25% commercial/office, 13% retail, and 15% social/institutional) |
| **Deep Lake Cooling** | | |
| Thermal Energy | Lake Source Cooling: Enwave data (assumptions based on total tons of refrigeration per gpm potable) | Lake Source Cooling: 1.98 kW(cool)/gpm at 72,000 gpm (assumes 40,600 tons refrigeration) |
| **Ashbridges WWTP** | | |
| Thermal Energy | Sewage Heat: from various sources including SHARC, ThermWin, TubeWin, Rabtherm, PKS-Thermpipe, etc. manufacturer data and daily treatment as Asbridges WWTP | Sewage Heat 1.93 kW(heat)/gpm (Ashbridges assumed 50% of the year in use due to combined sewer), 106,804 gpm of wastewater, COP of 5 |
| **Portlands Energy Centre** | | |
| Thermal Energy | Portlands Energy Centre: Information about size of system from Environment Assessment and annual reports | Portlands Energy Centre: Assumes 200MW of heat available (max) for 25% to 35% of the year |

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# Buildings and Affordability

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Sidewalk's vision of a complete community starts with a place that reflects and amplifies the social, cultural, and economic diversity of the Greater Toronto Area. It means a place that is inclusive, one that builds on Toronto's greatest strength—its diversity—and welcomes all comers to contribute to the fabric of urban life. It means a place that is flexible, one in which buildings and spaces can change to address the evolving needs of the populations they serve. It means a place that is accessible in every dimension: welcoming, pedestrian-friendly, participatory, and adaptable.

Most importantly, it means a place that is affordable.

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# Building Complete Communities

THE UNPRECEDENTED PRICING PRESSURE in the Toronto housing market has been well-documented. Unmet housing demand has generated rapid increases in rents and sale prices, persistently low vacancy rates, and severe limitations on homeownership and access to quality housing. The average home price in the GTA has climbed by roughly 33 percent over the past 12 months and now exceeds 900,000 CAD, while median family income has only shown annual growth of 3 percent in recent years. The numbers from the rental market tell a similar story, with condo-rentals climbing 12 percent over the course of 2016 and vacancy rates less than half of both New York City and Montreal.

If Toronto is to remain a city that is affordable for the diverse population from which it draws its strength, it needs a multipronged approach to a historically complex and notoriously difficult problem: the built environment is traditionally created in a moment in time and governed by static code. Developers fail to leverage the construction efficiencies provided by mass production. Zoning separates homes from offices and retail outlets when most people need all three on a given day. And master-planned communities often fall short of aspirations—locked into fixed typologies and conceived to address needs that are already out-of-date by the time construction is complete. This rigid system creates underutilized space, suppresses supply, and ultimately creates pricing pressures that undermine affordability.

Sidewalk's vision for a complete community will address how buildings are constructed, how they are governed by code and zoning, and how they adapt to the differing and ever-evolving needs of end users, touching both the supply and demand sides of the housing equation. Sidewalk's vision will allow buildings to be constructed more easily and less expensively—creating more efficient layouts that require less space per person and more adaptable spaces that better serve the demands of a changing population. In this way, the physical environment of Quayside and the Eastern Waterfront will be embedded with the same design principles as the digital environment: flexible and highly responsive to end-user needs.

Given the diversity of housing needs in the GTA, Sidewalk will also prioritize optionality in housing typologies, accommodating a wide variety of personal preferences and budgets. As Sidewalk iterates on this strategy in Quayside and throughout the Eastern Waterfront, it will strive not only to meet the demands of residents today, but to better position the city to meet the evolving demands of its residents in the future. Sidewalk's vision aims not only to reach the affordability goals laid forth in the city's Housing Opportunities Toronto Action Plan, but to exceed them.

In close collaboration with Waterfront Toronto, all three levels of government, and the community at large, Sidewalk will deploy new occupancy models, new modes of home ownership, and new innovative financing structures to transform the ways in which communities are organized and funded, and the ways they evolve. By anticipating and addressing the needs of its residents, new neighbourhoods on the waterfront will keep affordability at the forefront, improve the urban experience, and provide a scalable blueprint for delivering dynamic, socio-economically diverse, multigenerational communities across Canada and abroad.

Allocating 20 to 30 percent of housing units as affordable will be just one component of this holistic strategy. As the first place Sidewalk will prototype solutions across the five concepts discussed in this chapter, Quayside will be the testbed for an entirely new urban experience on the Eastern Waterfront.

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**Downtown's high-rise condominiums embody Toronto's rapid growth and demand for a new housing supply.**

Credit: Mark Wickens

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# Construction Methodologies

SIDEWALK THINKS HOUSES can and should be built like cars are built, through a vertically integrated process spanning the full product lifecycle from design to delivery. While this concept is not new, existing efforts have been unable to fully reap its benefits. A lack of vertical integration has limited manufacturing standardization and efficiencies. In many cases, buildings are designed before the decision is made to "go modular," leaving modular factories looking more like indoor construction sites than advanced manufacturing lines. Similarly, a lack of focus on upfront design considerations that would allow multiple aesthetic and functional configurations of a single chassis has led to the negative associations many consumers have with modular and low-quality, monotonous housing.

In Quayside, Sidewalk will employ new construction methodologies that have the potential to significantly decrease construction costs and lessen the design constraints of modular housing. This would create increased access to affordable housing by dramatically reducing the cost of adding supply. To achieve this vision, Sidewalk proposes a multifaceted approach using prefabrication and new material innovations—in particular, tall timber construction—to create solutions that will be replicated, improved upon, and brought to scale on the Eastern Waterfront.

## Modular Construction

Sidewalk will not be the first company to deliver modular construction, but its holistic, integrated approach to prefabrication will help it achieve the combination of cost savings and product improvements at scale that have so far eluded previous modular developers. Sidewalk's vision includes more than just volumetric construction modules—the six-sided boxes completed primarily off-site, shipped to a site, and installed by crane. Instead, Sidewalk will incorporate both linear (one-dimensional components) and planar (two-dimensional, panelized components, used as part of a standard construction approach, such as SIPS, CLT panels or curtain walls) systems in addition to volumetric systems. This comprehensive approach will enable the creation of an entire parts library with standardized connections and interoperability that will supply every major assembly in a variety of building typologies.

By combining this versatile product library with advanced manufacturing techniques, such as repeatable assemblies, robotic construction, on- and off-site automation, and 3D printing, Sidewalk will be able to achieve new production efficiencies in design, labor, and material use.

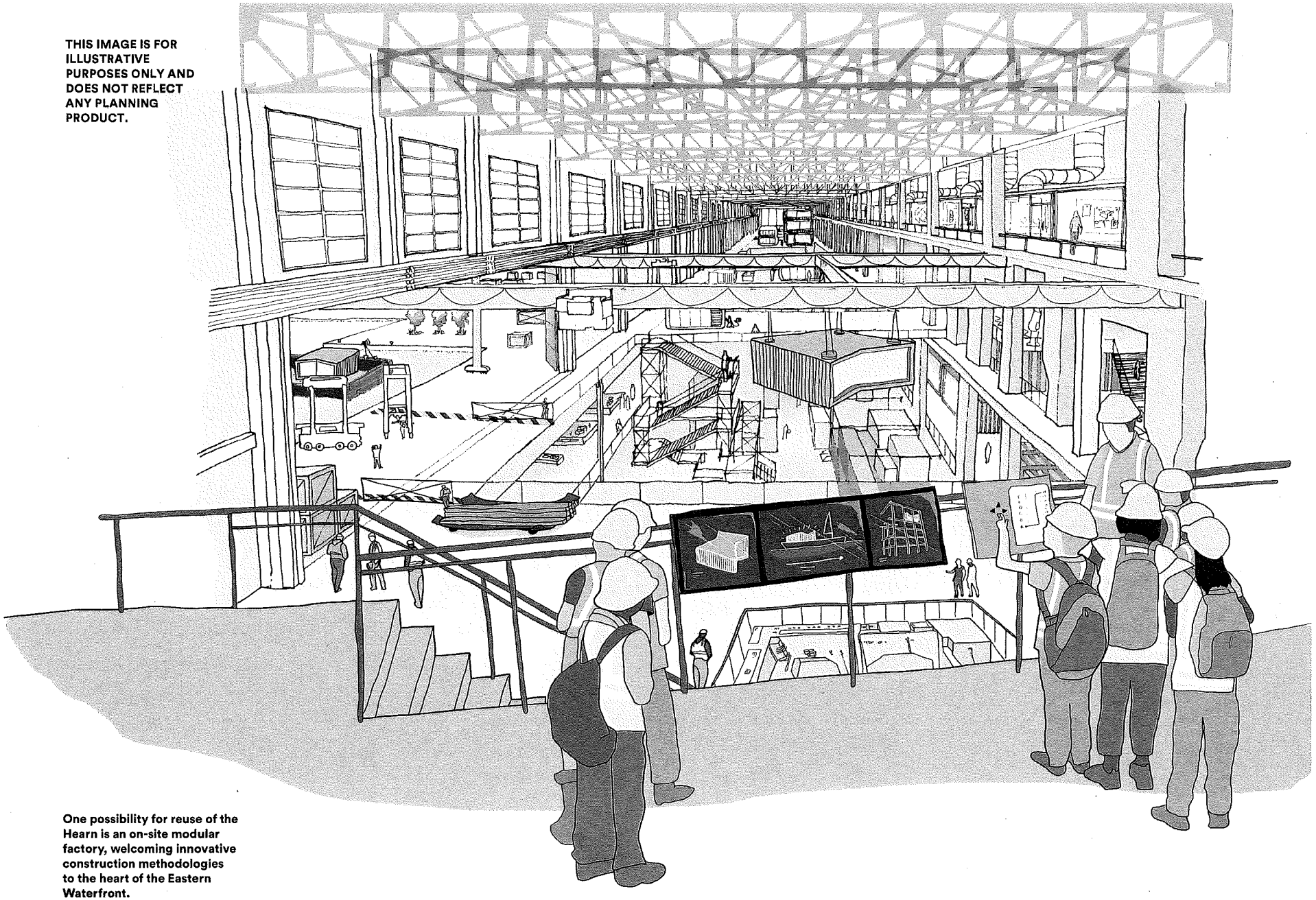
The integration of these systems will change the way structures are designed and built. Designing appealing spaces for residents and tenants will no longer require the expensive customization that defines stick-built construction. Mass production will facilitate scale efficiencies in layouts and design that will enable residents to live more comfortably in less space.

Together these innovations will capture an enormous opportunity to drive down the cost and time required for new construction at scale. In fact, Sidewalk estimates that modular systems can cut the assembly time in home production to one-third of conventional construction, saving both time and money. In addition to reducing the initial capital costs of construction, operating and renovating expenses will be reduced, as prefabricated units are interchangeable, standardized product components that can be easily replaced or recycled.

In advance of construction in Quayside, Sidewalk envisions embedding an innovation team from its Build Lab with one or more leading modular construction firms to design and test components and processes.

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One possibility for reuse of the Hearn is an on-site modular factory, welcoming innovative construction methodologies to the heart of the Eastern Waterfront.

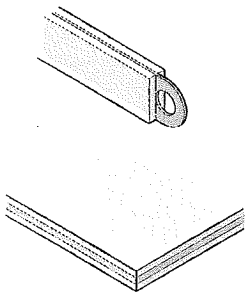
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# Material Innovation

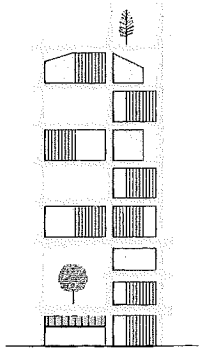
Another critical component of new construction methodologies is material innovation. Sidewalk is focusing its initial efforts on materials that are more sustainable without sacrificing affordability or design flexibility. As such, it will source ecologically benign construction materials that embody less energy and reduce waste sent to landfills.

At the forefront of Sidewalk's materials strategy is "tall timber," the construction of mid- or high-rise buildings with wood. New wood technologies offer advantages in terms of cost savings, speed of construction, and environmental impact compared to traditional steel and concrete. Timber can be locally sourced, further stimulating the Canadian economy and minimizing transportation costs. Wood construction is also faster, especially when leveraging prefabricated sub-assemblies. In fact, the use of lighter lumber segments can reduce installation and foundation work costs by up to 20 percent, while maintaining structural strength, flexibility, performance, and safety standards. Finally, tall timber performs better than traditional materials in terms of both embodied energy and resulting air and water pollution, while achieving a 90 percent reduction in carbon footprint (from steel's 1.82 kgCO2/kg to the 0.18 kgCO2/kg of dry wood). [Sources: Forest Foundation, Canadian Raw Materials Database]

Additionally, Sidewalk is exploring potential materials innovations in Structural Insulated Panels (SIPs), a standard construction material. Sidewalk's prototype aims to reduce embodied energy, waste, off-gassing, and toxicity by working primarily with two new materials: mycelium for structural strength, and Shikkui plaster for surfacing. Mycelium is a strong fungus that can be grown in confined spaces, using agricultural waste as feedstock. Shikkui plaster is a Japanese lime plaster made of slaked lime (a food additive) with additives including seaweed extracts, soybean oil, natural plant fibres, and other natural aggregates. Each natural component adds performance characteristics, such as stability, workability, water-repellency, and anti-cracking properties. These two materials represent opportunities to improve building performance, lower costs, and improve sustainability.



**Hybrid building systems and composite panels can be timber-based.**

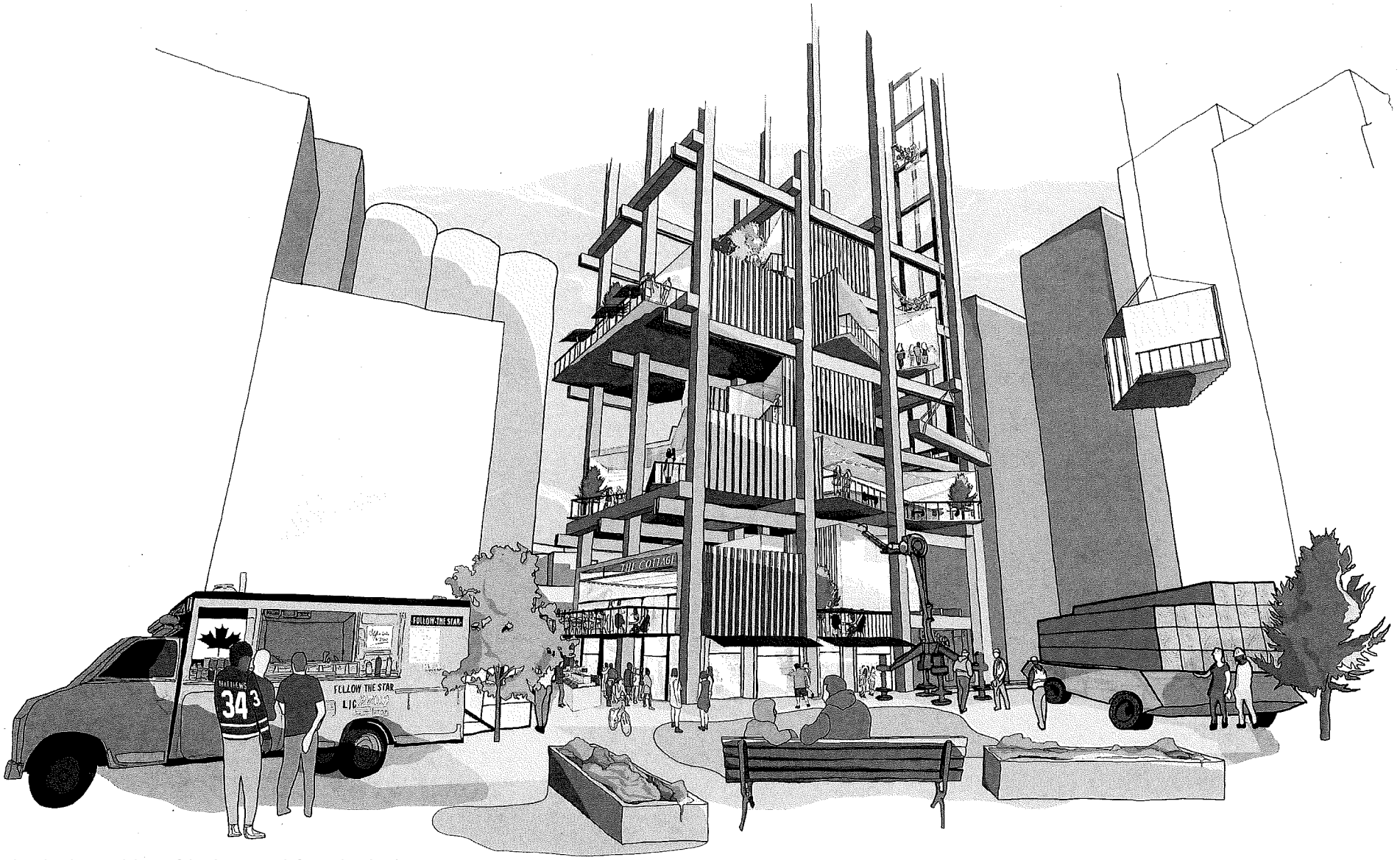


**Timber construction is possible at all scales and at pioneering height.**

Sidewalk believes that these combined innovations in pre-fabrication and materials should have an impact that cascades beyond construction savings. Radically standardized materials and units will lessen the burden of building code approvals. Expedited and more predictable construction timelines will lower contingency costs and shorten the payback period, increasing the availability of financing. And better overall project economics will open up new land for affordable residential construction.

**Opposite: Mid- or-high rise buildings will substitute traditional steel or concrete materials with lighter, more eco-friendly tall timber.**

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# Building Typologies

CITIES, THEIR ECONOMIES, AND THEIR DEMOGRAPHICS change over time, often in unpredictable ways. Building usages should change with them. The cast-iron buildings that line the streets of New York's SoHo today, for example, were once manufacturing sites housing massive machinery. Despite New York's decline as an industrial hub, these buildings have maintained their relevance—re-inventing themselves as light manufacturing spaces, small offices, live-work studios, and apartments. This multiuse life cycle is made possible by the buildings' strong skeletal structure—their "good bones"—allowing them to accommodate and anticipate changing use over time.

Quayside will be no different. Whereas today buildings tend to be designed for single use, Quayside structures will be designed upfront to accommodate a radical mix of uses and anticipate changing preferences. Optimized for optionality, spaces will be equipped with the core infrastructure to adapt to the evolving demands of Torontonians. A parking structure built for conventional vehicles today will be able to adapt over time to become a marketplace, makerspace, creative office, or residential lofts, as conventional cars become less prevalent and self-driving cars more popular.

The overarching goal is to allow neighbourhoods along the water to evolve to match changing user needs—a model that can wholly redefine urban experiences by maintaining dynamic neighbourhoods.

## Loft

Buildings today are usually designed for a singular purpose. However changing user needs and shifting economic conditions often demand change. This exposes a problematic mismatch: buildings are designed to last far longer than their users' needs remain constant.

While modular construction is one means of injecting flexibility into urban areas, a second strategy is to design buildings with an adaptable shell and versatile core structure that can be more easily flexed for different uses. This idea is the basis for Sidewalk's Loft concept.

Loft improves upon traditional loft buildings by planning explicitly for ongoing and frequent interior changes around a strong skeletal structure. Its structure will remain flexible over the course of its lifecycle, accommodating a radical mix of uses (such as residential, retail, making, office, hospitality, and parking) that can respond quickly to market demand.

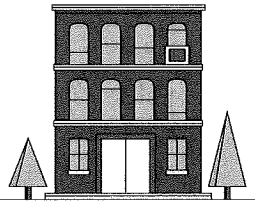
While the Loft concept is primarily geared toward renovations and retrofits to accommodate shifting user needs on a months- or years-long time frame, Sidewalk believes a retail-oriented variation of this notion could allow spaces to change almost daily. Sidewalk calls this derivative Next-Gen Bazaar. By outfitting space typically reserved for temporary retail uses—like farmers markets and shopping stalls—with the more sustainable core infrastructure developed for Loft, the waterfront can create greater diversity in the types of pop-up establishments that will appear for a limited time in different neighbourhoods. This will better serve the varied needs of new start-ups, makers, satellite restaurateurs, and more traditional businesses looking for temporary meeting or public engagement space. More specifically, it would allow them to experiment with new offerings and product lines without the overhang of a massive capital expense, creating a much more dynamic retail environment.

Sidewalk will prototype both the core Loft and Next-Gen Bazaar concepts in Quayside. The Loft pilot will likely contain parking space that could easily transition to other uses once shared mobility reduces private car use and parking needs. The Next-Gen Bazaar pilot will blend public and private space to allow retailers and new businesses to set up shop in Toronto's newest neighbourhood without upfront capital risk.

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## Typical Buildings

**Built only for one use**



**Today, all building systems have functional lifespans far beyond their desired lifespans, resulting in waste and inflexibility.**

**As illustrated below, building components made available by current construction methods are used for only a fraction of their potential material lifespan.**

**Structural Lifespan**

70 Years

**End of Function**

Building demolished prior to structure's end of life

**Enclosure Lifespan**

20 Years

Failure of weather barrier or poor thermal performance

**Interiors Lifespan**

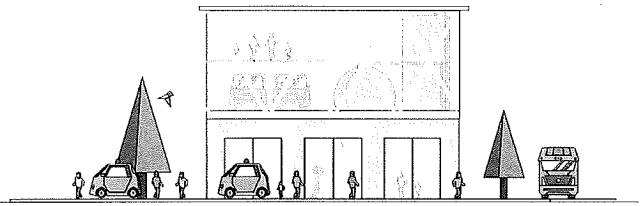
7 Years

Built-in-place drywall demolished for new use

Theoretical Typical

## Loft

**Built for the ages**



**Loft addresses this mismatch in use and lifespan by focusing on a robust building exterior, taking advantage of the extremely long lifespan of major building components.**

**Then, by making the interiors highly flexible with standardized dimensions and interconnections, Loft facilitates easy and ongoing adjustment so that even an old building will meet its users' needs perfectly and with minimal waste.**

**Structural Lifespan**

100 Years

**End of Function**

Highly durable armature lasts full lifespan when paired with flexible interiors

**Enclosure Lifespan**

40 Years

40 Years (in 5-to-10-year increments)

Reuse of modular panels when use or performance needs change

**Interiors Lifespan**

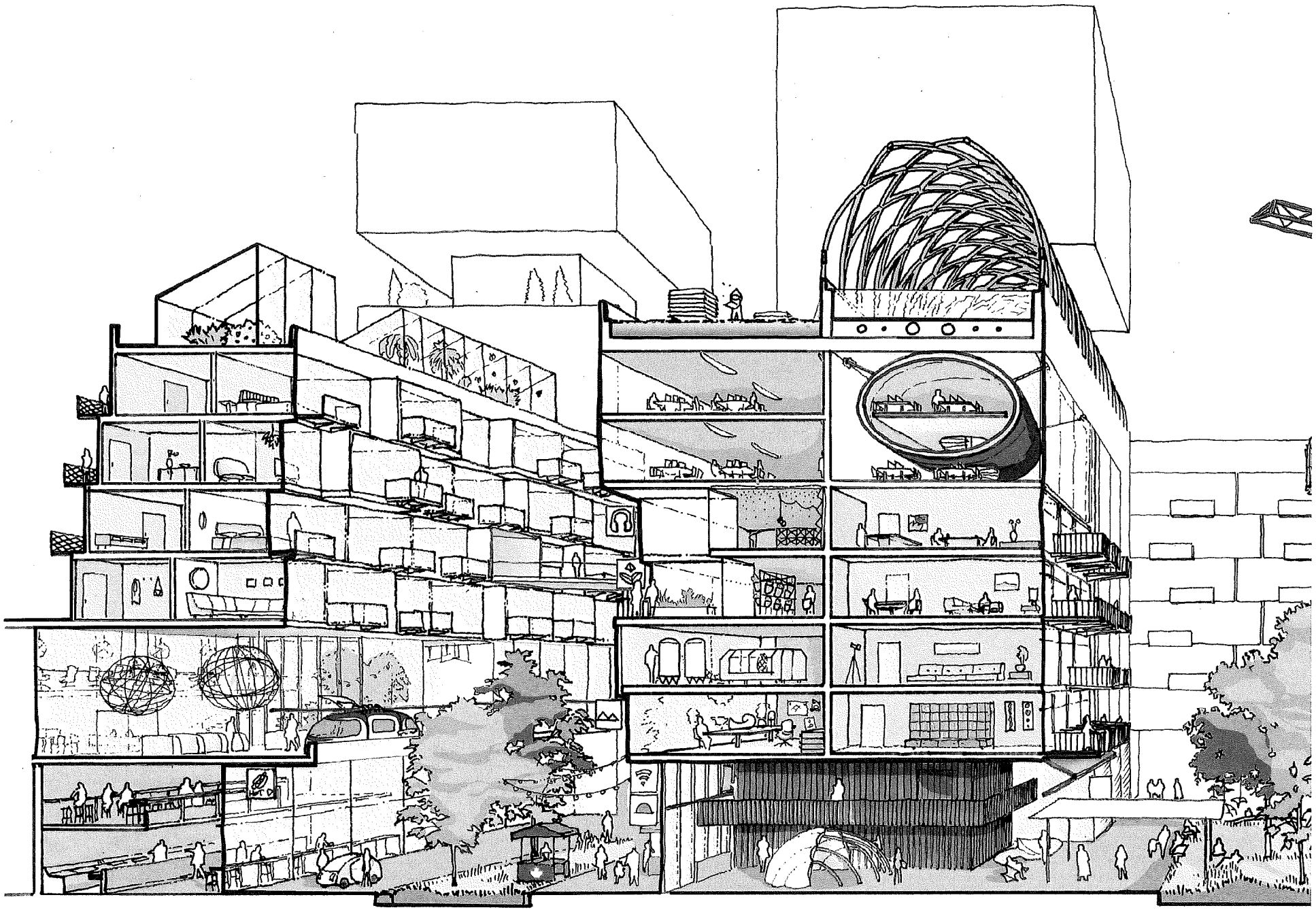
30 Years

30 Years (in 5-year increments)

Modular wall, floor, and ceiling panels are reconfigurable

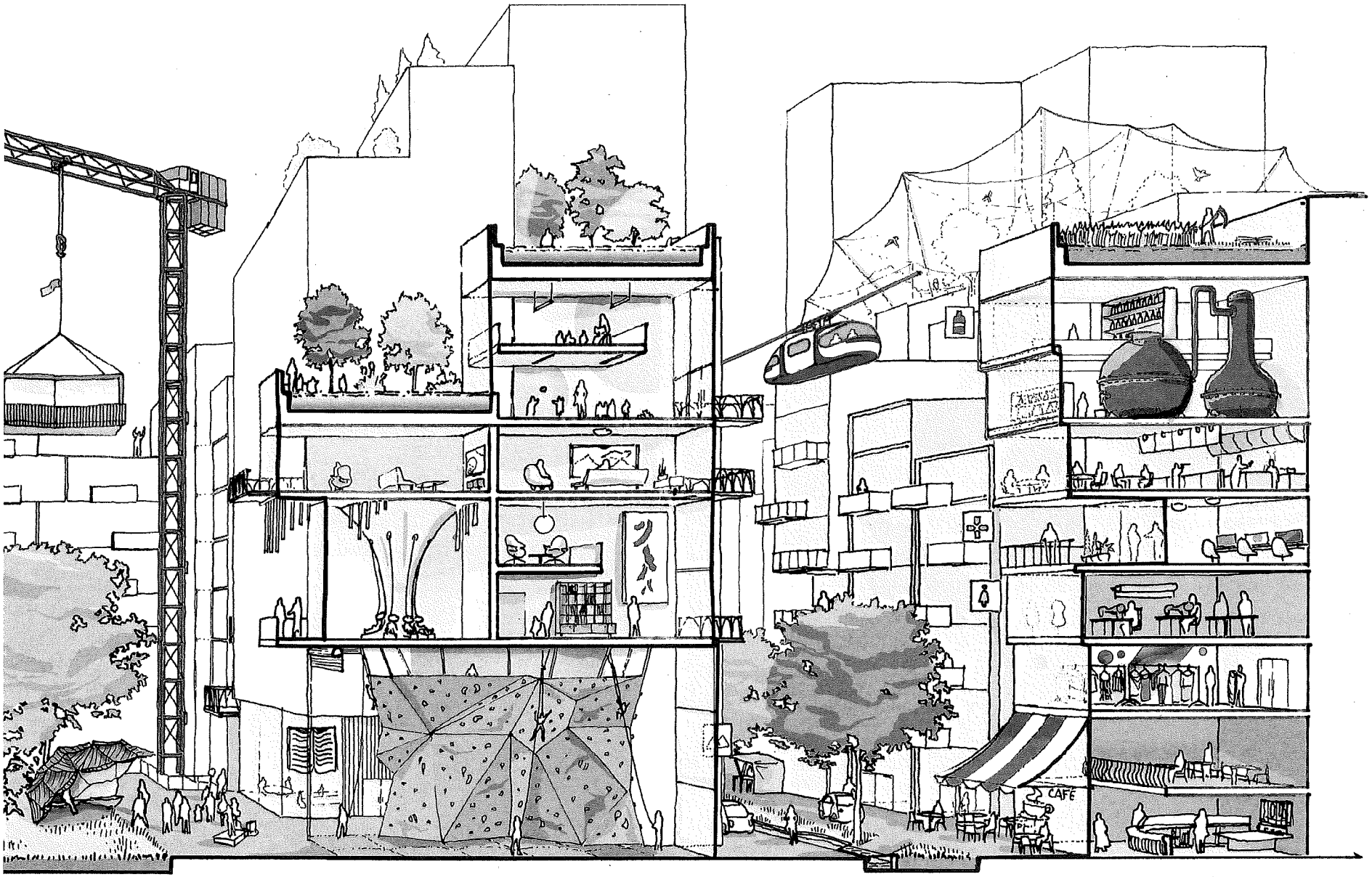
Theoretical Loft

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**Adaptable buildings, such as reconfigurable Loft spaces, enable completely radical mixed-use environments.**




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# Loft (continued)

## Technical Foundations

### Flexibility Founded on Standards

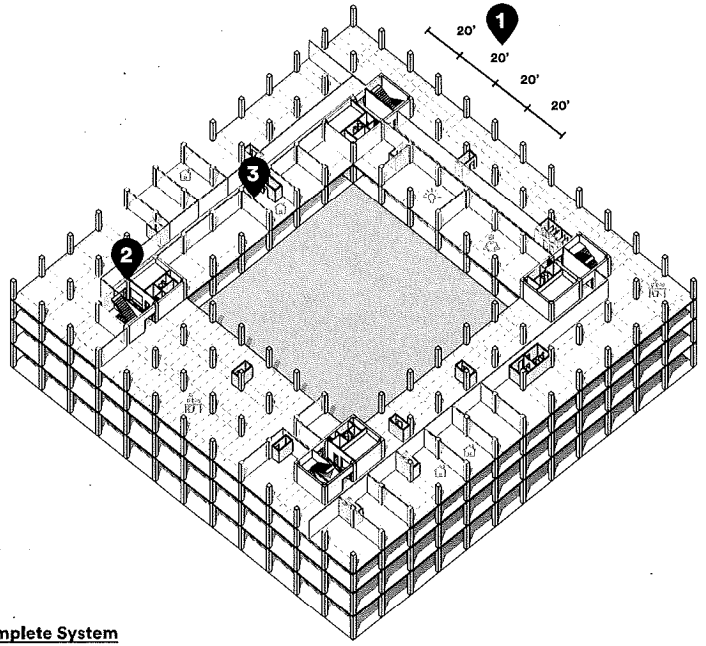
Loft buildings will be designed around standard units of five feet. For example, support beams, elevator shafts, and other fixed components will be placed only at multiples of five-foot intervals. This enables a wide variety of room sizes using the same parts—from a 5'-by-5' closet to a 10'-by-15' bedroom to a 40'-by-20' conference room. By creating standard interchangeable interfaces along with these standard dimensions, Loft will ensure that interior fittings, façades, doors, and similar building components are not only interchangeable and flexible, but also reusable.

This flexibility will allow for easy modifications to match evolving style preferences and floor-plan reconfigurations to serve changing space needs. With sufficient ease of adjustment, a company could reconfigure a space to accommodate a weeklong training seminar and then return it to offices or small conference rooms. A family might decide to subdivide a room to accommodate a visitor staying for a few months, or, they might recycle and exchange modular components when a room no longer meets their needs. Within the building, modular interior components will also facilitate easy access to utilities through standardized connections, further supporting future spatial reconfiguration and ongoing maintenance. Additionally, manufactured building components will help improve neighbourhood quality of life by using incorporated sensors to measure real-time building performance relative to applicable performance-based codes. Loft's flexible design and construction methods allow buildings to catalyze a wide range of uses, adapt to ongoing changes in land use, and meet future space demands, all while preserving the visual character of a neighbourhood.

### Modular Fitting and Components

The standards built into Loft will create a competitive marketplace of interchangeable fittings. The interiors of Loft will greatly reduce the cost and waste of interior remodelling because they will be standardized and reconfigurable. With standard sizes replicated throughout similar buildings, interior components become reusable, more like quality furniture than like drywall. Having interior fittings like doors, walls, and finishes that are reusable will have a significant impact on sustainability, helping to cut down on the approximately 200,000 tonnes of construction debris added to Toronto's landfills every year by renovations alone.

This interchangeability requires a high degree of standardization, including dimensions, basic services provided in each building, and the interior components themselves. The dimensions of the buildings, from the proportions of a block to the size of modular floor panels, should accommodate disparate and changing uses. This planning will ensure reuse, interoperability, and faster construction and renovation times, effectively future-proofing the structure for a variety of uses. Modern buildings with robust interior layouts get reskinned every 25 or 30 years to improve environmental performance and maintain a contemporary look. Loft's façade components will adopt the same standardized units to enable low-cost, frequent updates to the exterior. This loose-fit design—one built for easy disassembly and reuse of parts—has ancillary benefits to the environment as well, enabling structures to be built, renovated, and demolished at a roughly 30 percent less carbon cost than traditional demolition.




### A Complete System

Loft will create long-lasting but highly flexible buildings that can accommodate a variety of shapes, floor plates, and styles, all of which could be built to Loft standards.

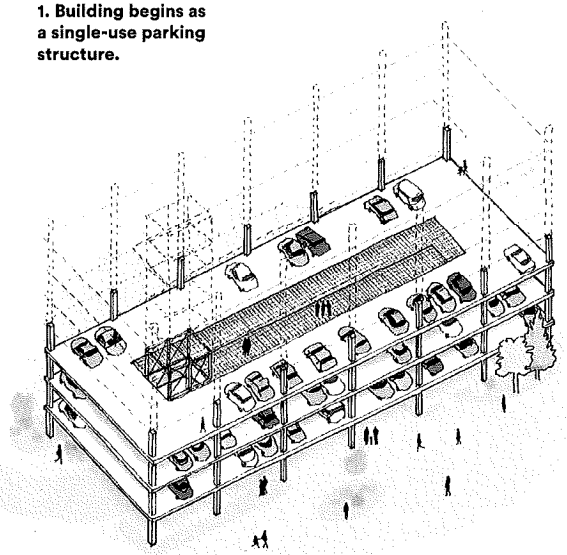
① Standard dimensions ensure that all of Loft's spaces and components are interchangeable.

② Generous stairways, utility capacity, and building services will support a wide variety of uses.

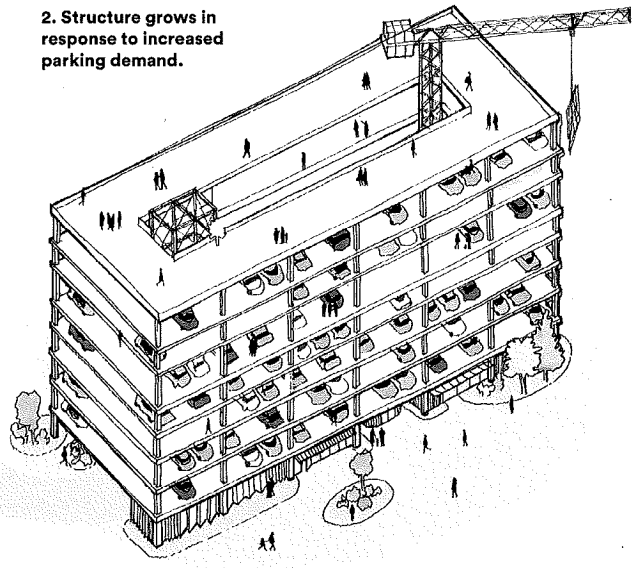
③ Modular interior fittings and façade modules ensure buildings are rapidly reconfigurable, and that components can be reused.

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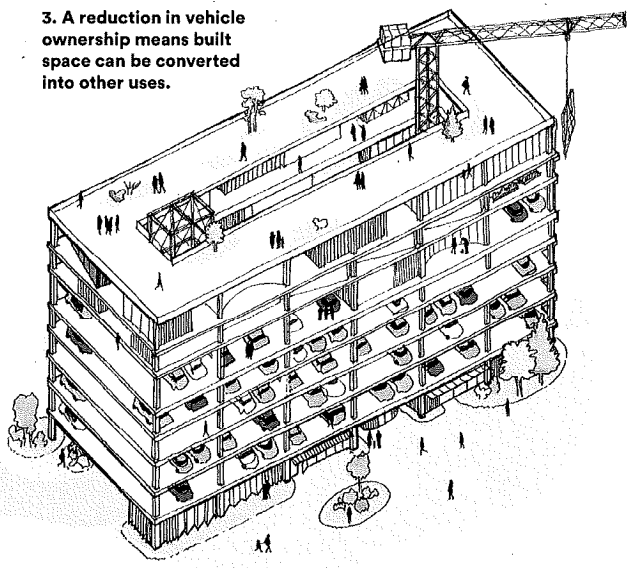
1. Building begins as a single-use parking structure.



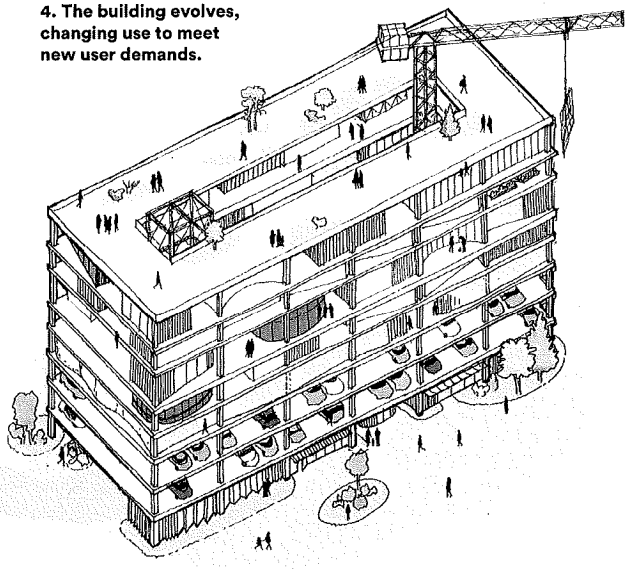
2. Structure grows in response to increased parking demand.



3. A reduction in vehicle ownership means built space can be converted into other uses.



4. The building evolves, changing use to meet new user demands.



One possible manifestation of Loft is a structure that can begin its life as a parking structure. Over time, as self-driving cars and better public transit change the demand for parking, the building can efficiently evolve for new uses.

In all, Sidewalk's flexible Loft structures will drive further affordability by better allowing the physical infrastructure to adapt cheaply and quickly to the changing needs of the neighbourhood. This can create incremental real estate value, keeping more inventory online at less cost. While designing these adaptable buildings for reuse will have higher upfront design costs, new units will be constructed at less cost and operated at significantly higher efficiency over traditional demolition models.

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# Outcome-Based Code

**IN ORDER TO FOSTER DYNAMIC NEIGHBOURHOODS** that can efficiently and safely deliver a shifting range of uses over time, a city must have an equally flexible building code that enables innovation without compromising safety.

Historically, static zoning and building ordinances are the mechanism by which cities regulate the built environment—construction, building use, neighbourhood composition, quality of life standards, building safety. These codes were the best tools cities had to segregate potentially harmful uses from residents. However, static regulations often result in low-quality, single-use neighbourhoods that reward obsolete approaches and penalize innovation.

Despite these problems, a city cannot do without building standards and zoning codes. The fundamental need to protect human health, ensure safe buildings, and manage negative externalities remains absolute.

But in today's environment—one where home and work are increasingly intermingled, and the building code definition of "manufacturing" often includes the large and growing maker economy—there is opportunity to improve upon static regulations and broad zoning codes with more precise tools and performance-based regulations.

As an alternative to traditional regulation, Sidewalk envisions a future in which cities use outcome-based code to govern the built environment. This represents a new set of simplified, highly responsive rules that focus more on monitoring outputs than broadly regulating inputs. With embedded sensing for real-time monitoring and automated regulation, this new code will reward positive behaviours and penalize negative ones, all while recognizing the value residents and visitors increasingly place on having a variety of uses within one neighbourhood.

Under such a system, rather than zoning for use types, the city could zone to protect against the negative externalities themselves usually associated with managing different uses. Instead of limiting light industrial space, the city could set maximum amounts of noise pollution and traffic; instead of limiting residential space, the city could set minimum standards for air quality, daylight access, comfort, and sustainability.

Sidewalk expects these codes to encourage more efficient and dynamic use of space, and expedite the path toward radical mixed-use neighbourhoods. By enabling greater adaptability, Outcome-Based Code incentivizes reuse rather than demolition, and leads to more sustainable and affordable ways to serve the community's needs.

This new system will reward good performance, while enabling buildings to adapt to market demand for mixed-use environments. It is Sidewalk's belief that outcome-based codes, coupled with sensor technology, can help to realize more sustainable, flexible, high-performing buildings at lower costs.

There is no doubt that adopting such a system is a long-term process in which safety and quality of life must be prioritized before rapid change. The first step in designing and evaluating this system is installing the necessary infrastructure and collecting the necessary data to accurately measure the types of impacts that are essential for protecting safety and quality of life.

Specifically, Sidewalk proposes to outfit buildings in Quayside, including Loft, with sensors to measure the data needed to explore the Outcome-Based Code system. Sidewalk plans to work with local agencies to design informative pilots that begin with comprehensive data collection within existing regulatory frameworks.

When fully implemented, Outcome-Based Code will have employed four strategies for meaningful reform:

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①

# Simplification

Today's building codes often include different standards for dozens of different types of buildings. While highly tailored, these different standards also make it difficult for one type of building to serve multiple uses or to change over time. Sidewalk will reduce the number of defined building types, targeting 80 percent of interior uses for reclassification into a new "use-neutral" category, in turn permitting a greater number of uses. This can support implementation of adaptable Loft units, versus the more stringent, static building codes of today.

**A simplified building code will reduce the number of defined building types.**

| Existing International Building Code Use Groups | | Example Proposed Use Groups | |
|---|---|---|---|
| A-1 | Theatre and Performances | A-1 | Theatre and Performances |
| A-4 | Indoor Sporting Events | A-4 | Indoor Sporting Events |
| A-5 | Stadiums | A-5 | Stadiums |
| I-2 | Hospital, Nursing Homes | I-2 | Hospital, Nursing Homes |
| I-3 | Jails | I-3 | Jails |
| **A-2** | **Restaurants and Bars** | | |
| **A-3** | **Worship, Recreation, Amusement** | | |
| **B** | **Public and Private Businesses** | | |
| **E** | **Education** | | |
| **F-1** | **Moderate-Hazard Factory (Industrial)** | | |
| **F-2** | **Low-Hazard Factory (Industrial)** | | |
| **I-1** | **Supervised Residential Adult Personal Care Services** | | |
| **I-4** | **Day Care Facilities** | | |
| **M** | **Mercantile/Retail** | | |
| **R-1** | **Transient Living Spaces** | | |
| **R-2** | **Multiple Dwelling Units Buildings** | | |
| **R-3** | **Single Dwelling Units** | | |
| **R-4** | **Assisted-Living Facilities** | | |
| **S-1** | **Moderate-Hazard Storage** | | |
| **S-2** | **Low-Hazard Storage** | | |
| U | Utilities (Misc. Structures) | U | Utilities (misc. structures) |
| H-1 | Materials with Detonation Potential | H-1 | Materials with Detonation Potential |
| H-2 | Materials with Deflagration Potential | H-2 | Materials with Deflagration Potential |
| H-3 | Materials that are Easily Combustible | H-3 | Materials that are Easily Combustible |
| H-4 | Materials that are Toxic and Corrosive | H-4 | Materials that are Toxic and Corrosive |
| H-5 | Hazardous Production Materials (HPM) | H-5 | Hazardous Production Materials (HPM) |

**80% of Building Uses Will Fit Into the One New Flexible Use Category**

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## ②
# Flexibility Enabled by Monitoring

Sidewalk will begin implementing this strategy in Quayside by reviewing existing building codes, identifying the performance levels that are implicit in today's design standards. Covering topics such as life safety, daylight access, air quality, comfort, sustainability, and infrastructure capacity, these targets will ensure that Quayside's buildings perform as well or better than those governed solely under existing code. Whenever possible, Sidewalk will convert these performance targets into outcome standards that will be enforced through monitoring during use, rather than pre-build restrictions. Sidewalk's fundamental belief is that Toronto can realize lower costs and higher performance through a mix of flexible building design and real-time use management.

# Current vs. Proposed Conditions

**Compared to a generic approach to zoning and code, Sidewalk's Outcome-Based Code emphasizes flexibility and innovation while adhering to the same standards and increasing compliance.**

| | Current System | Outcome-Based Code System |
|---|---|---|
| **Use Mix** | Uses separated to avoid conflicts | Conflicts managed by monitoring and guaranteed enforcement |
| **Structural Integrity** | Design review is only real point of enforcement | Ongoing structural monitoring enables new construction techniques |
| **Daylight Access** | Building shaped to avoid shadow | Creative site-specific solutions encouraged based on performance |
| **Nuisance** | Uses restricted to prevent noise/odour issues; after permitting, complaint based | "Trust but verify" approach enables creative uses but ensures that violators are immediately enforced by fine or other intervention |
| **Energy/Water** | Energy/water modelling required to test designs, but outcomes never checked | Actual performance monitored for compliance with standards, enabling lower-cost, more creative solutions |

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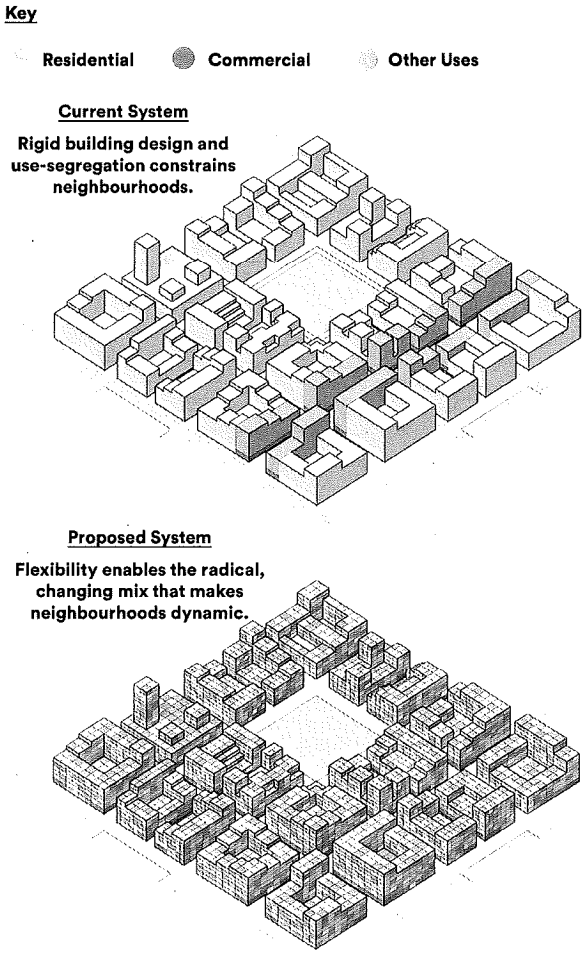
## ③
# Interoperability

An additional component of the code will ensure that buildings have the facilities and the interoperability to create a well-functioning district. Rather than create plot-by-plot rules, the code coordinates objectives across scales: building, block, neighbourhood, and district. Most cities have some type of requirement along these lines. For example, elevators must allow firefighters to override controls. But Sidewalk's system approach will require a greater level of interoperability in terms of solid waste disposal, modular interior fittings, utility channels, and similar systems. Taken together, these requirements will mandate that buildings accommodate these district-wide functions in a standard way.

## ④
# Automated Permitting Review

As of late 2013, some 20 percent of Toronto's building permit applications took longer to process than deadlines set out in provincial regulations. Outcome-based code will change that. Throughout the planning and design phases, Sidewalk's digital layer will provide instant feedback on whether a specific design option meets performance and safety criteria. Thus, the broad range of development possibilities will be clear to owners, architects, and end users, while limiting the hindrance of documentation or review processes.

# These Strategies Enable Radical Mixed Use




Eventually, Sidewalk envisions piloting outcome-based code in parallel but subordinate to existing regulatory frameworks in Eastern Waterfront neighbourhoods. When the approach is further validated, it will become the primary system in those neighbourhoods, and then finally, expand back into existing Toronto neighbourhoods as the necessary hardware retrofitting is achieved. This entire process will be undertaken in partnership with the City of Toronto (in accordance with its Zoning bylaws and Municipal Code), the Province of Ontario (and its Ministry of Municipal Affairs and Housing), and other key governmental agencies critical to setting public standards.

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# Occupancy Models

OVER 40 PERCENT OF TORONTO'S HOUSEHOLDS are currently occupied by a single person. According to the Canada Mortgage and Housing Corporation, these households are projected to grow faster than any other type over the next two decades, making them Canada's largest household type by the mid-2020s. Single-person households are more likely to rent, and on average, spend more per person on housing than larger households.

Sidewalk believes there is a real opportunity to experiment with new occupancy models in Quayside. By trading gross square footage for efficiency of design and optimization of community services and amenities, Sidewalk believes that new occupancy models can offer this large and growing segment of the population a better housing product at a materially lower cost. And while the pursuit of innovative occupancy models is often weakened by the misconception that they are the exclusive province of the young, it is important to recognize the potential value these models bring to a diverse population of residents. There is little doubt that the 42 percent of the GTA's young adults aged 20 to 29 who still live in a parent's home (drastic increases from historical levels of 32 percent in 1991 and 27 percent in 1981) will benefit from an expansion of housing types; however, individuals in the 55-and-older cohort, who have a need for more community, services, and/or care than those that can be provided by a co-inhabitant alone, have much to gain as well. These models could also benefit low-income and homeless populations.

These alternative occupancy models will never fully supplant Toronto's core multifamily housing stock, but they will open up Quayside to a diversity of residents and forward-looking uses that might not otherwise be attainable. And more broadly, these models can be a powerful tool in helping the city meet its goal, as expressed in the Housing Opportunities Toronto Action Plan, of assisting nearly 260,000 households to find or keep the affordable housing options they need. Sidewalk is committed to using Quayside as a laboratory for experimenting with these models—including co-housing, micro-units, and other alternative typologies.

## Co-housing

Sidewalk and Waterfront Toronto can work together to break away from traditional leasing models, instead ushering in a new standard of living based on flexibility, community, and affordability. Sidewalk's initial efforts in this process will build on current co-housing models, improving access to convenient options that offer a high level of amenities and services included in the base rental cost. Sidewalk offers the potential to create newer models for Torontonians by integrating a digital layer—one that empowers residents to organize and make their own programming decisions. Effectively, Sidewalk believes all aspects of one's housing should be easily accessible and controllable through a digital interface—the ability to select a new unit in a new location, to reserve and control shared space, to coordinate in-home care and refill prescriptions, to digitally communicate with neighbours for babysitting, or to organize Sunday-night family-style dinner.

In addition to the enhanced level of convenience and accessibility afforded to Torontonians, these co-housing models should offer improved economics. Radical sharing of durable goods, Splitting costs of building and personal services, and increasing space efficiencies (up to 70 percent, by some estimates) offer tangible monetary benefits that will be passed on to residents. [Source: Negev Co-Living Model]

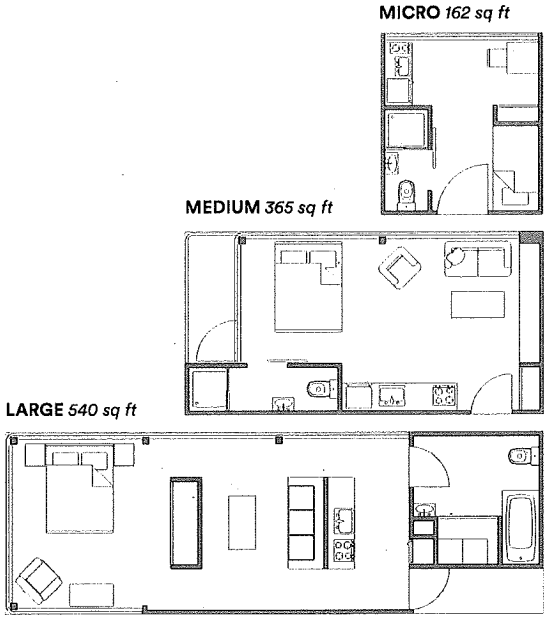
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# Micro-units

Micro-units will also be part of the solution. Sidewalk team members were intimately involved in New York City's first pilot with affordable micro-units, an initiative that revealed tremendous interest and demand for less expensive, small (250 and 350 square feet), private living spaces. The result, Mt. Carmel Place, was the first micro-unit building constructed in New York City, delivering 55 units at a lower cost than existing studio apartments in the neighbourhood. Nearly 60,000 applications were received for the 14 units formally designated as affordable. The addition of this type of unit in a high-demand Manhattan neighbourhood provided access to the core of the city for people who would have otherwise been unable to afford to live there. With similar dynamics at play in downtown Toronto, and a virtual blank canvas with which to work on the Eastern Waterfront, the impact at scale of a micro-unit program could be transformative for the local housing market.

**Possible Module Sizes and Layouts**

**Micro-units offer smaller, affordable alternatives to traditional apartments, while offering more privacy than shared living arrangements.**




By providing a diversity of housing typologies, Sidewalk and Waterfront Toronto can significantly enhance resident's quality of life. For instance, the integration of a digital layer can bring individuals of shared interest and values together. From a building owner's perspective, more innovative occupancy models create potential for higher resident retention, incremental building value, reduced operating costs, and streamlined user-friendly property management. Most importantly, these typologies will open the door for a wider range of affordable housing options—and thus help facilitate a community that truly reflects the socio-economic, cultural, and generational diversity of the Greater Toronto Area.

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# Home Ownership and Innovative Financing Structures

SINCE 2010, THE CITY OF TORONTO has worked with developers (both nonprofit and private sector) to construct nearly 3,000 affordable rentals and nearly 800 affordable ownership homes, working towards its target of 10,000 affordable rental homes and 20,000 affordable ownership homes by 2020. Waterfront Toronto alone, through its ambitious development programs, has built 500 affordable housing units, with an additional 80 under construction. Despite this progress, the city is predicted to fall short of its 10-year target, given the current pace of construction.

Even if fully achieved, the 10-year goal will improve housing options for many, but will not fully address the housing crisis in Toronto, nor supply the entire estimated 88,000 households currently waitlisted for affordable units. Thus, in addition to the new occupancy models discussed above, it is imperative that Sidewalk creates an environment that incentivizes the ongoing delivery of apartments that can accommodate households of all income levels.

Sidewalk recognizes that achieving sustainable affordability in Toronto will require a deep understanding of both market drivers and potential policy interventions. Several members of the Sidewalk team played key roles in the development and implementation of New York City's New Housing Marketplace Plan. The plan was responsible for the creation and preservation of more than 165,000 affordable housing units over the past decade, and was the basis for implementing a set of tools that yielded an unprecedented volume of new affordable housing construction. These tools included low-cost financing (80/20 program), dedicated revenue streams (the NYC Housing Trust Fund), and tax abatements (421-a). New York's first exploration into inclusionary housing also occurred during this period.

Sidewalk will work with local stakeholders to develop multifamily financing and affordable home ownership solutions that are uniquely tailored to Toronto's market dynamics. These could be modelled after existing programs like those found in New York, chart a new way forward (such as a national "affordable housing bank" that will act in a similar manner to the proposed Canadian Infrastructure Bank and provide low-cost financing for projects that meet agreed-upon affordability thresholds), and/or draw on successes in other major urban centres throughout the world.

Sidewalk will also pursue models of partial ownership that have proven to be successful in Toronto and abroad. For example, Sidewalk will work in partnership with Toronto's existing nonprofit organizations that provide affordable housing options in the GTA, leveraging models where a nonprofit serves both as a residential housing developer and as an investment fund or lender to the occupant. This allows the nonprofit entity to sell units for a combination of "cash and kind," and make units available for purchase to people who would otherwise be unable to afford them. Working with Waterfront Toronto, Sidewalk is committed to giving these housing non-profits a platform in Quayside and the broader Eastern Waterfront on which to expand their work.

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**Sidewalk will work with Waterfront Toronto to make a diverse set of housing options available to all Torontonians.**
Credit: Mark Wickens

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# Roadmap

| Product Development Strategy: | |
|---|---|
| **Construction Methodologies** | Sidewalk is surveying best-in-class players for prefabrication/modular construction and innovative materials, and is in active partnership discussions with several industry leaders. Sidewalk envisions embedding an innovation team from its Build Lab with one or more leading modular construction firms to design and test components and processes. Additionally, Sidewalk will expand on its early experiments in innovative building materials (including tall timber and mycelium/Shikkui plaster SIPs) to inform new building designs. |
| **Building Typologies** | Sidewalk is currently working with BuroHappold Engineering on the technical principles underpinning the Loft concept. To catalyze the creation of an initial concept, Sidewalk and Waterfront Toronto will launch a "Loft Competition" to solicit broad input on potential designs from a range of sources. |
| **Outcome-Based Code** | Sidewalk will work with Waterfront Toronto and the relevant regulatory agencies—including the City of Toronto and the Province of Ontario's Ministry of Municipal Affairs and Housing—to identify provisions that may be appropriate for prototyping and stress-testing an outcome-based code approach. Sidewalk's dedicated Build Lab team will assess the feasibility of Outcome-Based Code that appropriately regulates the building inhabitants, and design the necessary hardware and software needed to measure standards effectively. |
| **Occupancy Models** | Sidewalk will inventory community living models currently in use in the GTA and will collaborate with Toronto residents, building an advisory council with vision-aligned residents of target segments to articulate ambitions for the space. |
| **Financing Structures** | Sidewalk will partner with Toronto's local, provincial, and federal partners to identify and refine product and policy innovations, creating a development strategy for Quayside as a living laboratory. Sidewalk will actively leverage its experience in New York City's evolving affordable housing landscape to collaborate with Waterfront Toronto and improve access to affordable housing. |

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| Quayside Pilot: | Eastern Waterfront Manifestation: |
| --- | --- |
| In partnership with one or more industry players, Sidewalk will prototype both modular and tall timber construction in Quayside. Specifically, Sidewalk envisions using the same modular "base" to construct a diversity of building types on different parcels, including at least one high-rise modular structure, to demonstrate the flexibility of its modular approach. Sidewalk also plans to explore opportunities to apply other innovative materials (e.g., mycelium/ Shikkui plaster SIP) in at least one building in Quayside. | At scale in the Eastern Waterfront, Sidewalk will shift a meaningful portion of construction to the techniques prototyped in Quayside. The Eastern Waterfront will feature modular multifamily housing, built (potentially at an on-site modular factory) with the aid of automation and material innovation. The increased volume of units produced for the Eastern Waterfront will achieve greater cost reductions while providing greater flexibility to the end user. |
| Following the Loft Competition, Sidewalk will refine the design for a pilot project (two stories or higher with a parking structure), finalize a use plan, and undertake permitting approval (applying for waivers) for Quayside planning. During the pilot, Sidewalk will assess its ability to monitor building code as well as its progress toward sustainability and affordability goals. | Following initial occupancy on the Quayside site, Sidewalk will closely monitor building performance to assess and improve design specifications, manufacturing, construction, and installation processes in real time. Sidewalk envisions building multiple Loft structures with different initial uses, while maintaining certain structures for continuous prototyping and experimentation, particularly on interior renovations. |
| Sidewalk will outfit a series of Quayside buildings (across all use types) with a network of sensors to measure structural integrity and environmental quality. Sensors will likely include vibration, noise level, light level, temperature, humidity, carbon monoxide, per-circuit electricity usage, and movement via infrared or radar. These sensors will be registered with the district Map database and transmit measurements in real time. To ensure privacy, access to these measurements will be available only to authorized systems and users, and will feed into a compliance platform, tracking real-time performance in accordance with the code. | Sidewalk envisions piloting outcome-based code in parallel with but subordinate to existing regulatory frameworks in Eastern Waterfront neighbourhoods, then as the primary system in those neighbourhoods, monitoring the built environment for public nuisances, ensuring that light manufacturing, commercial use, office space, and residential housing can coexist safely, and laying the groundwork for wide-scale adoption. Finally, Sidewalk envisions Outcome-Based Code expanding back into existing Toronto neighbourhoods as the necessary hardware retrofitting and regulatory approvals are achieved. |
| In Quayside, Sidewalk will develop test properties and will collaborate with Waterfront Toronto to attract residents of different tenures through community-based structures, emphasizing prototypes geared toward people at all stages of life. Integration of digital and physical networks will help to gather residents of common interests. | Sidewalk will develop further test properties in the Eastern Waterfront and, in conjunction with Waterfront Toronto, will continually test, learn, and adjust these models, establishing a launchpad for expansion to the broader Eastern Waterfront. |
| The Sidewalk team will partner with city government and community organizations to pilot financing and affordable home ownership models in Quayside, with the intention of scaling offerings across the Eastern Waterfront in future years. | Successful pilots in Quayside will be scaled to the Eastern Waterfront where a proven track record will help secure increased financial and political support. |

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# Mobility

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Sidewalk's vision for mobility represents nothing less than a paradigm shift, relying on a full suite of tools and options for residents, workers, and visitors from across the Toronto area.

Quayside will be a place where transit enhancements, forward-thinking urban design, and technology make car-ownership rates the lowest in Toronto and walking and cycling the primary modes of transportation.

When the systems piloted in Quayside are deployed together with innovations make possible by the scale of the Eastern Waterfront, they will shape the future of urban mobility around the world.

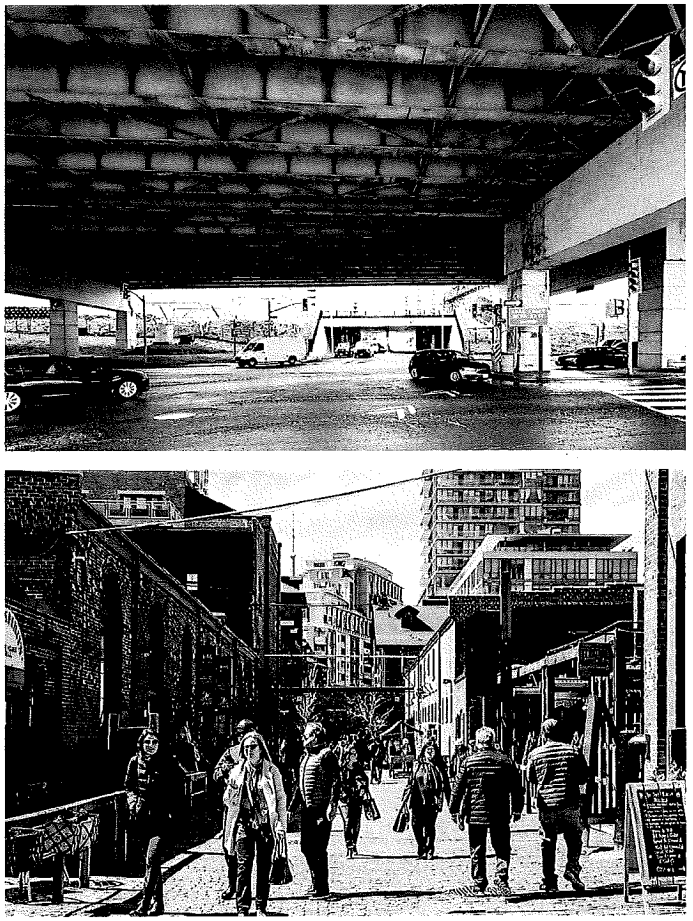
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# Moving Towards a Car-Free Neighbourhood in Quayside

DESPITE ITS PROXIMITY TO DOWNTOWN TORONTO, Quayside risks being a car-dominated area because it sits at the junction of two major highways and is cut off from the neighbourhoods to its north. To achieve walking, cycling, and transit rates similar to other downtown neighbourhoods will require interventions to connect Quayside to the heart of the city: from streetcar extensions, to an abundance of bikeshare stations, to creative solutions that make crossing the Gardiner Expressway easy and inviting for pedestrians and cyclists.

Sidewalk's plan, however, will do all this and make the neighbourhood a case study in mobility innovation. A comprehensive strategy that includes weather mitigation, shared ride services, and limited parking to discourage private car ownership will make walking and cycling the dominant modes of transportation in Quayside. A fleet of shared, energy-efficient vehicles will mean that when residents must drive a car, they can, but without the need to own one. And when they do, they will emit no greenhouse gases. Altogether, Sidewalk's plan will virtually eliminate transportation-related greenhouse gas emissions from Quayside residents.

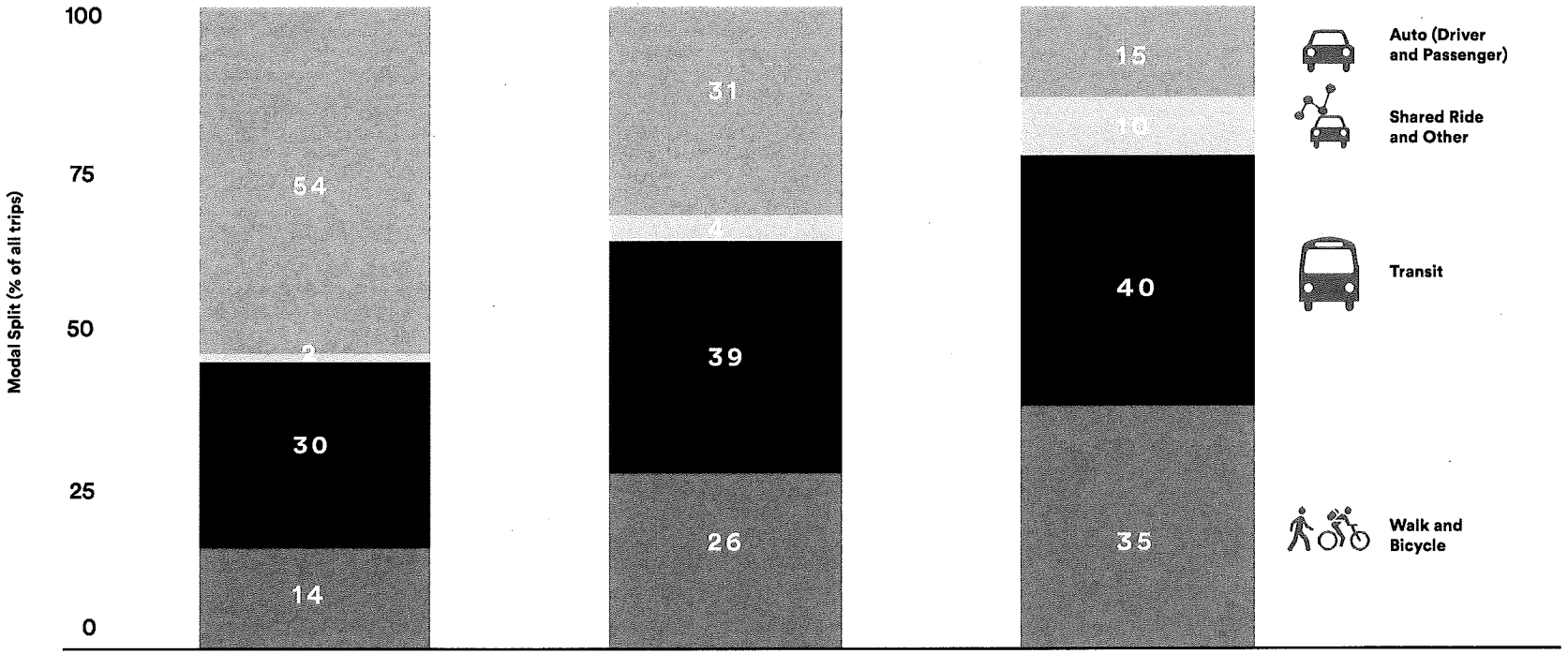
In addition, Quayside will be the place to pilot new technology that represents the future of urban transportation. Robot-driven urban freight, city-friendly self-driving shuttle buses, and traffic lights that can sense pedestrians are some of the systems that can make a positive difference in Quayside itself and lay the groundwork for larger-scale innovation and system enhancements that can be deployed on the Eastern Waterfront.



**Although only blocks away from each other, Quayside and the Distillery District are worlds apart in terms of the modal choices their current layouts encourage. Key to making Quayside into a pedestrian, bike, and transit-oriented neighbourhood is giving it a high-quality public realm and linking it fully into the sidewalk, bike path, and transit network of downtown Toronto. Even the Distillery District's area, however, has significant auto ownership rates, suggesting even greater improvement is necessary.** Credit: Mark Wickens

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# A Plan for Greener, Healthier Transportation Choices




**Business as Usual**

**Although Quayside sits in Ward 28, its highway access, lack of direct streetcar service, and the barrier created by the highway/rail corridor make it possible that its future mobility patterns could reflect the more auto-dependent Ward 30 to its east. Ward 30's mode splits, shown above, would be a severe disappointment for a site with such potential.**

Source: Transportation Tomorrow (2011), 24-hour mode shares for residents of Wards 30 and 28. "Shared ride" includes other modes such as school bus, taxi, and GO Transit.

**Best Practice Plans**

**Integrating Quayside into downtown Toronto using best practices would result in a mode split more reflective of Ward 28, shown above. This would include several of Waterfront Toronto's requirements: a mixed-use environment, pedestrian and cycling amenities, and less parking, as well as current plans such as links under the Gardiner and the proposed Eastern Waterfront streetcar. By making it easier to walk, bike, or take transit to downtown, these modes would increase dramatically and displace driving. Nonetheless, parking availability in the surrounding neighbourhoods and convenient highway access could still encourage higher auto orientation than for neighbourhoods in the center of downtown Toronto.**

**Sidewalk Vision**

**Sidewalk's vision for Quayside goes further than current best practices. Mitigating weather effects will encourage even more walking and biking by doubling the amount of time that the outdoors feels comfortable; Sidewalk estimates this to switch 9 percent of trips away from driving and transit. Shared-ride services will eliminate the need for many auto trips, especially among the very short trips to drop off a passenger; this should enable a 6 percent switch to rideshare, from driving and transit. Carsharing will reduce auto ownership, providing the ability to drive when necessary, but also prompting residents to take transit when the auto is not really needed. With these innovations, Quayside could be the most auto-independent neighbourhood in Toronto.**

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# Stitching Quayside into Downtown Toronto

AS ONE OF NORTH AMERICA'S MOST PEDESTRIAN-ORIENTED CITIES, and increasingly an attractive place for cycling, Toronto offers an excellent network of walkable streets and bike lanes. Quayside will connect to the sidewalk and cycling network of the rest of the city, across the currently formidable barrier of the Gardiner Expressway. Walking will be the dominant mode choice for all trips within the neighbourhood and into the vibrant neighbourhoods just to the north. Cycling rates will be among the highest in the city. Altogether, walking and cycling will make up 35 percent of all trips by residents.

Sidewalk's walking and cycling strategy has three components:

**1. Designing for short trips**

Core to achieving high levels of walkability and bikeability is the right urban form. Quayside will be planned so that all residents live within a five-minute walk from everyday needs, with parks, grocery stores, restaurants, and transit nearby.

Cycling will be easy and convenient, with an abundance of Toronto bike share stations. This density of pedestrian and bicycle amenities will lead to WalkScore and BikeScore ratings of more than 95.

**2. Connecting to the rest of the city**

Quayside's mobility network will create extensive connections with existing and planned cycling and pedestrian networks in Toronto. In addition, it will feature a brand new pedestrian/cycling bridge to connect with Parliament Street and hook into the potential path north of the Esplanade, and provide for much-needed north-south service.

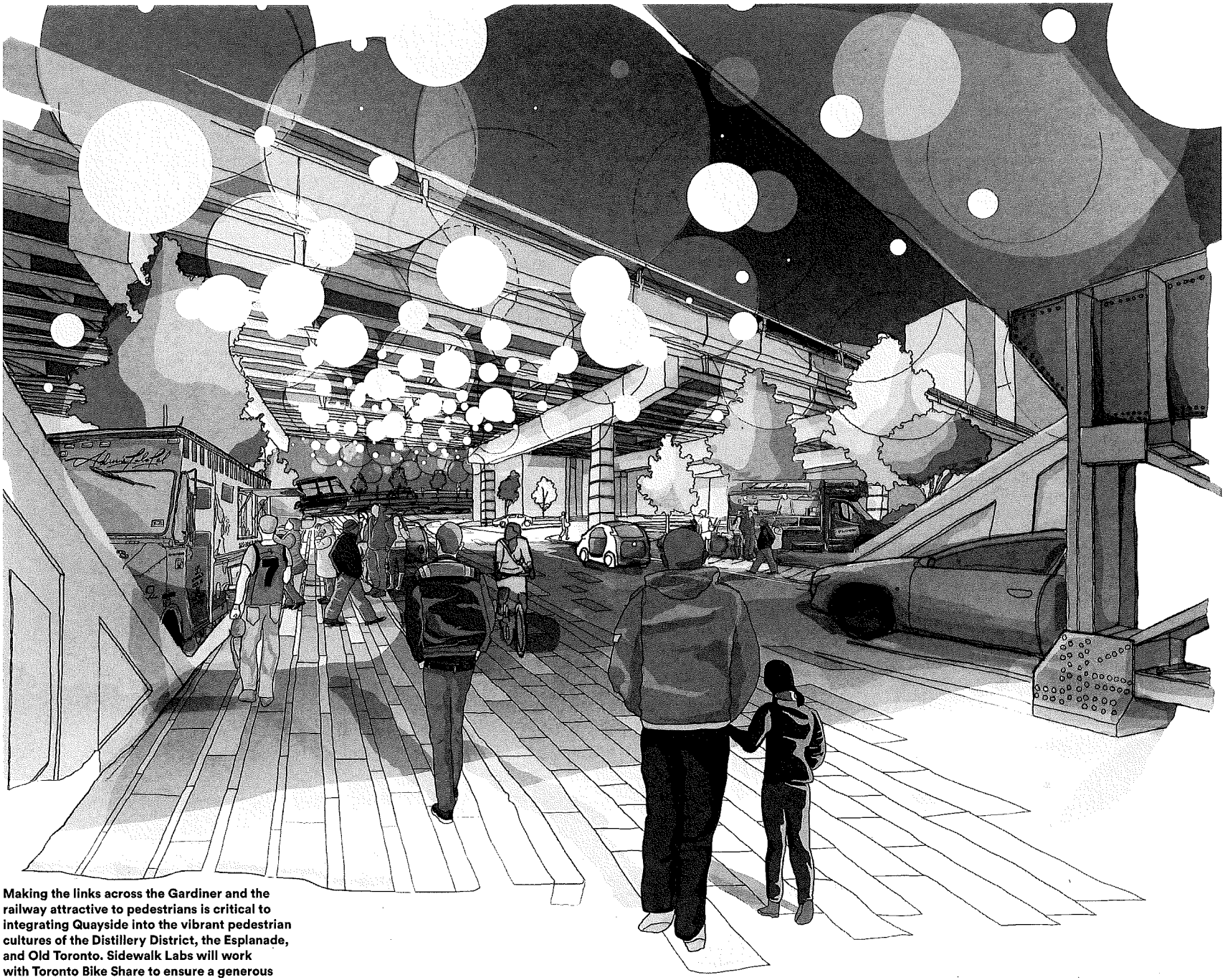
Quayside's location creates a natural impulse to walk or cycle to adjacent areas, like the Distillery District. However, as the city's TOCore strategy notes, access between downtown and its waterfront is unappealing because of the Gardiner Expressway and the rail corridor. Incremental changes, including improved lighting, public art installations, and protected space for food trucks and other programming, will help make both the Parliament and Cherry Street underpasses more attractive, but the potential exists to create a truly iconic link to the heart of the city.

**3. Making the public realm pedestrian- and bike-friendly**

A core part of Sidewalk's mobility strategy is a public realm that invites and facilitates more active transportation options.

An intelligent public realm management system will identify the maintenance needs of the streets and sidewalks before pedestrians and cyclists are inconvenienced; it will also track the demand for sidewalk, bike lane, and road space and allocate lanes accordingly through pavement-embedded LEDs that can signal changing uses. Responsive traffic signals will identify pedestrians and cyclists and manage auto traffic to give them priority.

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**Making the links across the Gardiner and the railway attractive to pedestrians is critical to integrating Quayside into the vibrant pedestrian cultures of the Distillery District, the Esplanade, and Old Toronto. Sidewalk Labs will work with Toronto Bike Share to ensure a generous provision of bike stations.**

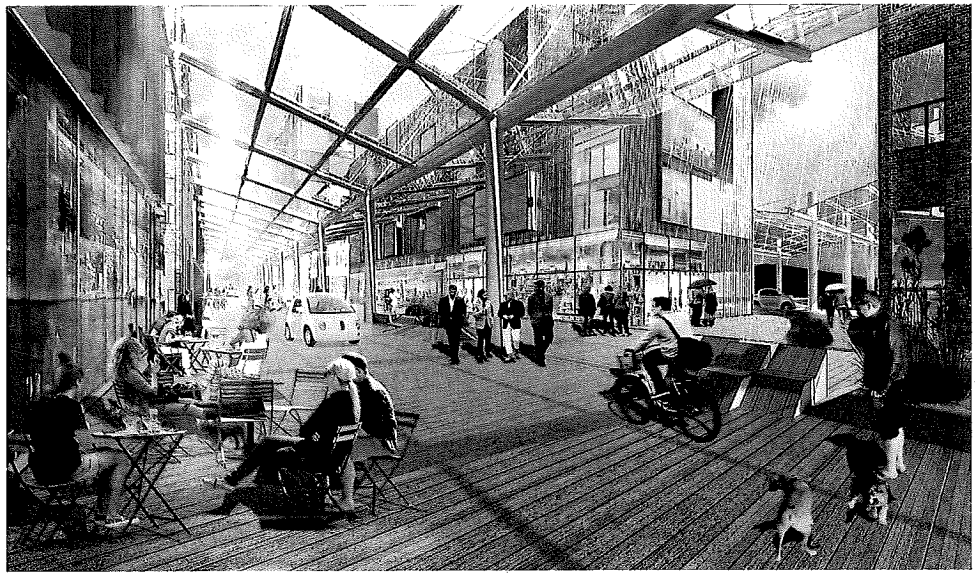
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# Weather Mitigation to Further Encourage Active Mobility

TORONTO'S CLIMATE IS PART OF ITS DNA, but wind, rain, and extremes of hot and cold weather keep people indoors more often than is necessary and discourage active mobility.

Innovative urban design, new lightweight materials, and better weather prediction capabilities make it more feasible than ever before to manage the outdoor experience without turning public spaces into indoor winter gardens. Awnings that block rain, physical structures that block wind during the winter but not during the summer, and sun shades can all add significantly to the daytime and evening hours when the experienced temperature feels comfortable to most people.

In planning Quayside, Sidewalk will incorporate a variety of weather mitigation strategies into buildings, pedestrian areas, and bike lanes. A fully implemented set of interventions could more than double the number of hours that people spend outdoors, dramatically increasing walking and cycling as a means to get around.

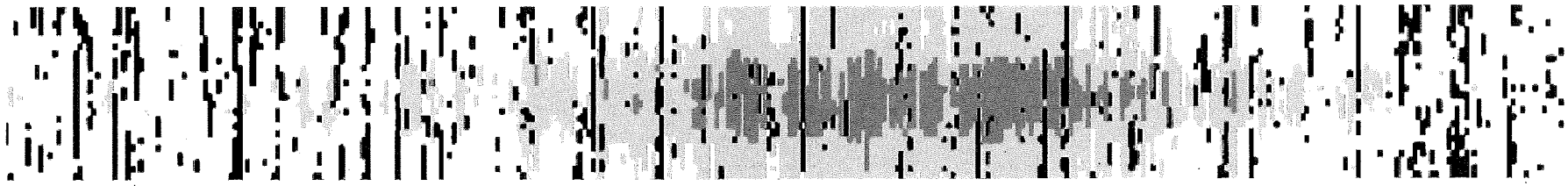


**Weather mitigation structures will make outdoor public spaces more widely used, more of the time.**

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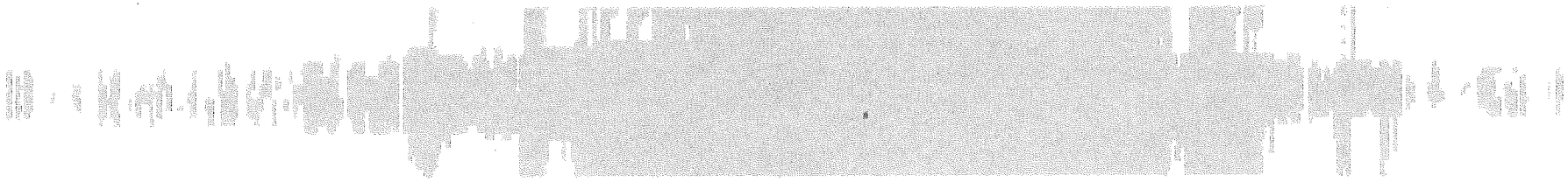
## More Comfortable Hours Outdoors Per Year

### Current



January — 2,364 Comfortable Hours Outdoors per Year — December

### With Sidewalk's Proposed Weather Mitigations



January — 5,131 Comfortable Hours Outdoors per Year — December

**Mitigating Climate: This grid shows comfortability during every hour of every day over an average year, as measured at Billy Bishop Airport. Comfort is defined using the universal thermal comfort index. In Toronto, there are on average 2,364 total comfortable hours in a year. Using analytically-determined weather mitigation interventions, including basic wind breaks and trees, Sidewalk will increase total comfortable outdoor hours to 5,131 per year.**

Source: Environment Canada

**Legend**

- Precipitation
- Too Hot
- Comfortable
- Too Cold

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# Linking to Downtown: Expanding Quayside's Transit Accessibility

SIDEWALK BELIEVES THAT A FEW KEY, strategic transit investments can transform Quayside into one of the most transit-connected parts of the city. These include extensions of existing transit lines as well as the creation of new services, and will require creative partnerships with Waterfront Toronto and the Toronto Transit Commission.

While the planned waterfront streetcar is one critical link, Sidewalk's vision includes several other incremental improvements that together will enable high-quality transit access to most downtown destinations.

This will enable most Quayside residents, and most Quayside workers, to get to their jobs by transit.

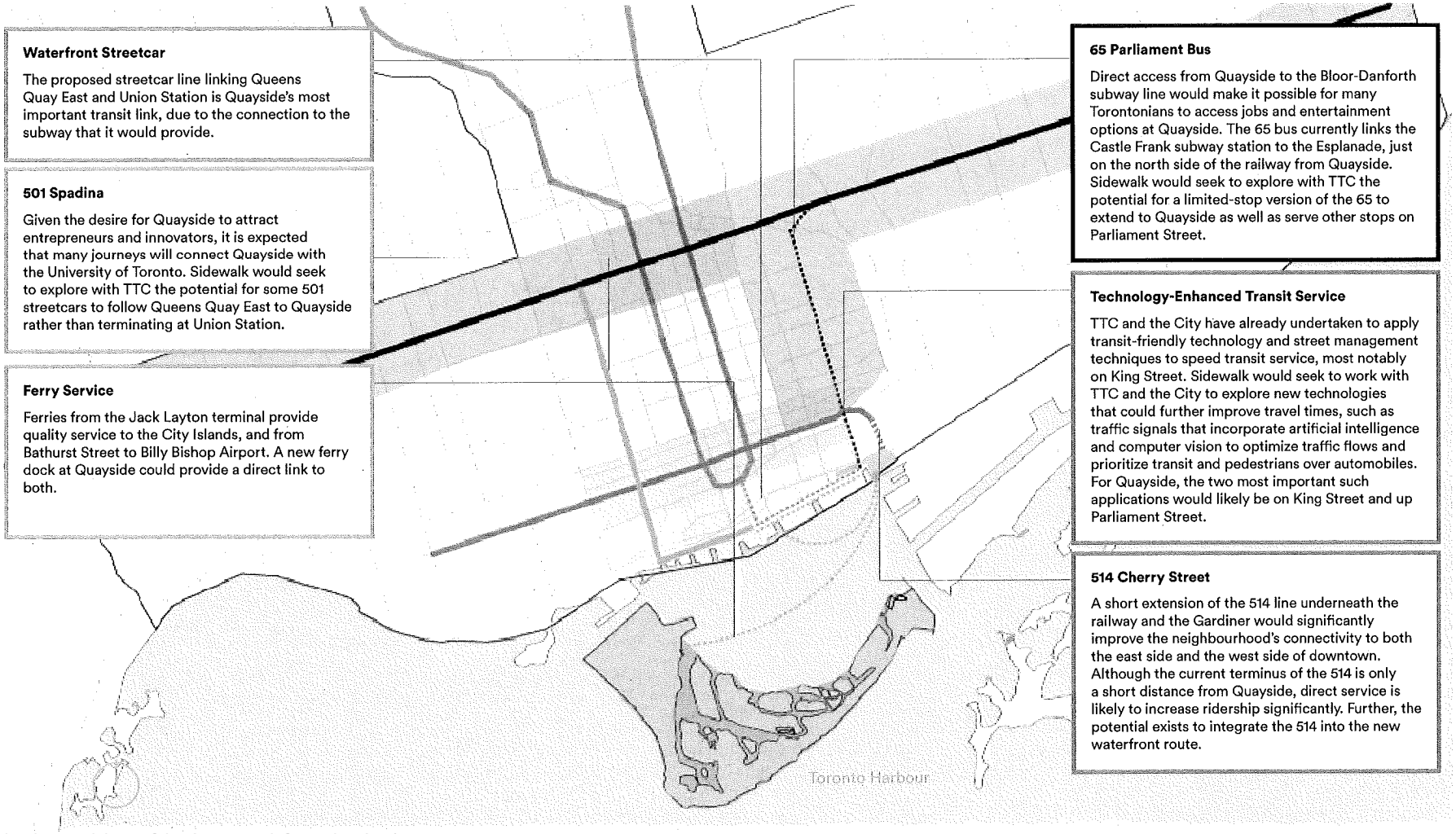


**Extension of existing streetcar service is a critical part of the plan to better connect Quayside with Downtown Toronto.**

Credit: Mark Wickens

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# Transit Enhancements




**Waterfront Streetcar**

The proposed streetcar line linking Queens Quay East and Union Station is Quayside's most important transit link, due to the connection to the subway that it would provide.

**501 Spadina**

Given the desire for Quayside to attract entrepreneurs and innovators, it is expected that many journeys will connect Quayside with the University of Toronto. Sidewalk would seek to explore with TTC the potential for some 501 streetcars to follow Queens Quay East to Quayside rather than terminating at Union Station.

**Ferry Service**

Ferries from the Jack Layton terminal provide quality service to the City Islands, and from Bathurst Street to Billy Bishop Airport. A new ferry dock at Quayside could provide a direct link to both.

**65 Parliament Bus**

Direct access from Quayside to the Bloor-Danforth subway line would make it possible for many Torontonians to access jobs and entertainment options at Quayside. The 65 bus currently links the Castle Frank subway station to the Esplanade, just on the north side of the railway from Quayside. Sidewalk would seek to explore with TTC the potential for a limited-stop version of the 65 to extend to Quayside as well as serve other stops on Parliament Street.

**Technology-Enhanced Transit Service**

TTC and the City have already undertaken to apply transit-friendly technology and street management techniques to speed transit service, most notably on King Street. Sidewalk would seek to work with TTC and the City to explore new technologies that could further improve travel times, such as traffic signals that incorporate artificial intelligence and computer vision to optimize traffic flows and prioritize transit and pedestrians over automobiles. For Quayside, the two most important such applications would likely be on King Street and up Parliament Street.

**514 Cherry Street**

A short extension of the 514 line underneath the railway and the Gardiner would significantly improve the neighbourhood's connectivity to both the east side and the west side of downtown. Although the current terminus of the 514 is only a short distance from Quayside, direct service is likely to increase ridership significantly. Further, the potential exists to integrate the 514 into the new waterfront route.

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# Reducing Dependence on the Private Automobile in Quayside

THE STRATEGIES OUTLINED HERE—expanding Quayside's transit connections to downtown Toronto, making it easier to cross the Gardiner, and mitigating weather conditions to make the area more hospitable to walking and cycling—will go a long way toward achieving Sidewalk's goal of reducing the share of all residents' trips made by privately-owned vehicles to 15 percent.

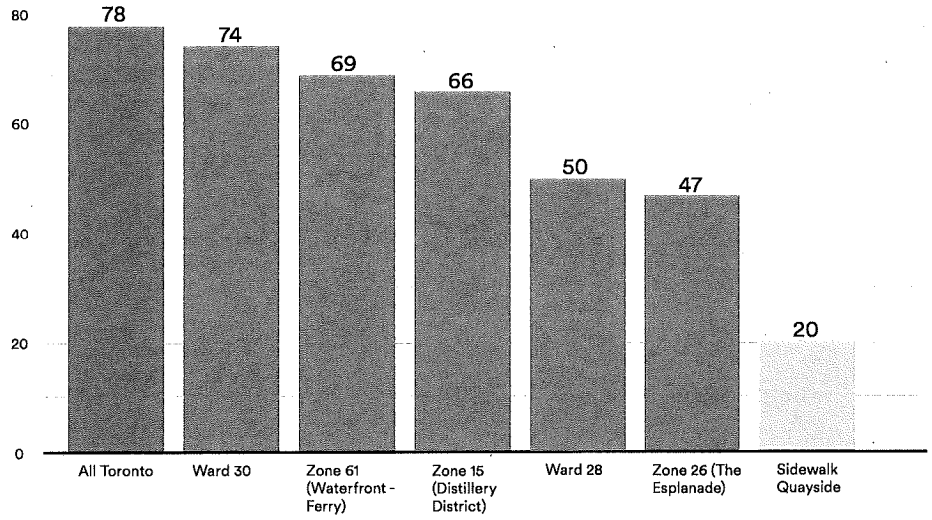
With this reduction will come a decline in rates of auto ownership. Citywide, 78 percent of Toronto households own a vehicle. The neighborhoods adjacent to Quayside have auto-ownership rates of more than 70 percent, due to their proximity to the highway and the availability of parking.

In the absence of a comprehensive mobility plan, it is reasonable to expect that Quayside will have similarly high auto-ownership rates. Even with good-practice efforts at integrating Quayside into downtown Toronto, it would be likely that Quayside would have auto ownership rates comparable to the Esplanade area, at 47 percent.

To drive the auto-ownership rate even lower—to Sidewalk's target of 20 percent—parking in Quayside will be limited and carefully managed, using a combination of Flow's technology and parking pricing strategies that discourage the discretionary use of automobiles. Further, it will be necessary to provide alternatives for those trips where people find an automobile to be genuinely useful, by offering shared rides and shared vehicles to ensure that giving up a car does not mean giving up mobility.

## Reducing Auto Ownership

**Percentage of households with one or more vehicles**




**Auto ownership levels in the current zones adjacent to Quayside reflect levels in Ward 30 rather than the rest of Ward 28, in which Quayside sits. Among other things, this reflects the proximity of the highway and the availability of parking. With Sidewalk's approach to making shared rides and shared vehicles available, and to managing parking, it will be possible to expect auto ownership rates far lower than even in the neighbouring Esplanade. Based on Ward 28 data, roughly 10% of households have no alternative to owning a car for their mobility needs; it appears that the remaining 50%+ of households own vehicles for shorter trips around the city and occasional longer trips out of the city. Sidewalk believes the combination of nearby amenities, shared rides, and car sharing can make it unnecessary to own a car for the vast majority of these purposes, making it possible to reduce discretionary auto ownership rates to around 10%, yielding target of 20% auto ownership.**

Source: Transportation Tomorrow (2011)

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## Innovative Parking Strategies

A critical determinant of the decision to own a car, or to drive to a destination, is the availability and cost of parking. Both as a result of Sidewalk's target auto ownership rate of 20 percent, and to help achieve it, Quayside will have less than half the number of parking spaces than would be included in areas of comparable size. Sidewalk will use technology to manage and vary parking pricing and to empower travelers with information that discourages facile reliance on cars.

Traditionally, retail centres and attractions make parking inexpensive for all users, which inadvertently incentivizes driving even for those visitors who have a good transit alternative.

In Quayside, Sidewalk will pilot a program that keeps parking prices high, but offers discounts to people who are coming from areas, or at times, when transit options are limited. Technology will enable pricing to vary in real time based on transit availability.

Sidewalk's portfolio company, Flow, is developing products that present the true times and costs of trips (such as parking and tolls) to travelers through consumer navigation apps that they already use. This capability will be especially important when it comes to realizing the full effect of price-managed parking in Quayside.

Using Flow's technology, a user planning to travel to Quayside would see both transit and driving options, paired with all associated fares, tolls, and parking fees. Travelers would be empowered to make decisions based on the true economic costs–in time and money–of each transportation mode.

## Flow's Parking Services




**Information on the congestion of roads, as well as the availability and price of parking, will be communicated to the user in ways that help them make decisions that minimize frustration and driving, as shown in prototypes from Flow's Parking service.**

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# Providing Access Where Transit Is Less Competitive

WHILE MAKING QUAYSIDE WALKABLE, BIKEABLE and transit-accessible will make it possible to conduct the vast majority of trips without a car, there will be some trips where transit is less attractive as an option. Some relatively short trips might require one or more transfers by transit, and thus driving would be much faster even in downtown traffic. A small portion of residents will have jobs or other commitments that require the frequent use of an auto. And many residents find that an automobile is useful even for occasional trips, which is why auto ownership far exceeds the number of households who rely on the automobile on a daily basis for the journey to work.

Reducing auto ownership will play a major role in ensuring that the automobile is only used for trips where it is distinctively valuable. But for those trips, enabling a car-free life requires providing options for people to get where they need to go without owning a car.

Sidewalk's vision for Quayside includes a heavy reliance on two such strategies. For short trips, shared-ride services are especially appropriate. For longer trips, car-sharing for residents can offer people the ability for the occasional trip without encouraging them to decide to buy a car.

## EV Sharing for Residents

Many urbanites choose to own a car even when they use it infrequently. But owning an automobile encourages usage because many of the costs are fixed. Carsharing has demonstrated its ability to allow urbanites who do not own cars to have the occasional access they need without stimulating unnecessary driving trips, or occupying valuable land for parking.

Sidewalk's vision is to ensure that all residents have access to a fleet of shared, electric vehicles (EV). This will meet residents' needs with a fleet of vehicles only a tenth as large as if they owned cars at the rates of neighbouring areas. And by centralizing maintenance, and providing parking equipped with EV charging, the necessary transportation can be provided at a much lower cost and with little impact on the environment.




**EV carsharing will provide a way for residents of Quayside to reach destinations beyond downtown easily while eliminating the incentive to own their own car.**

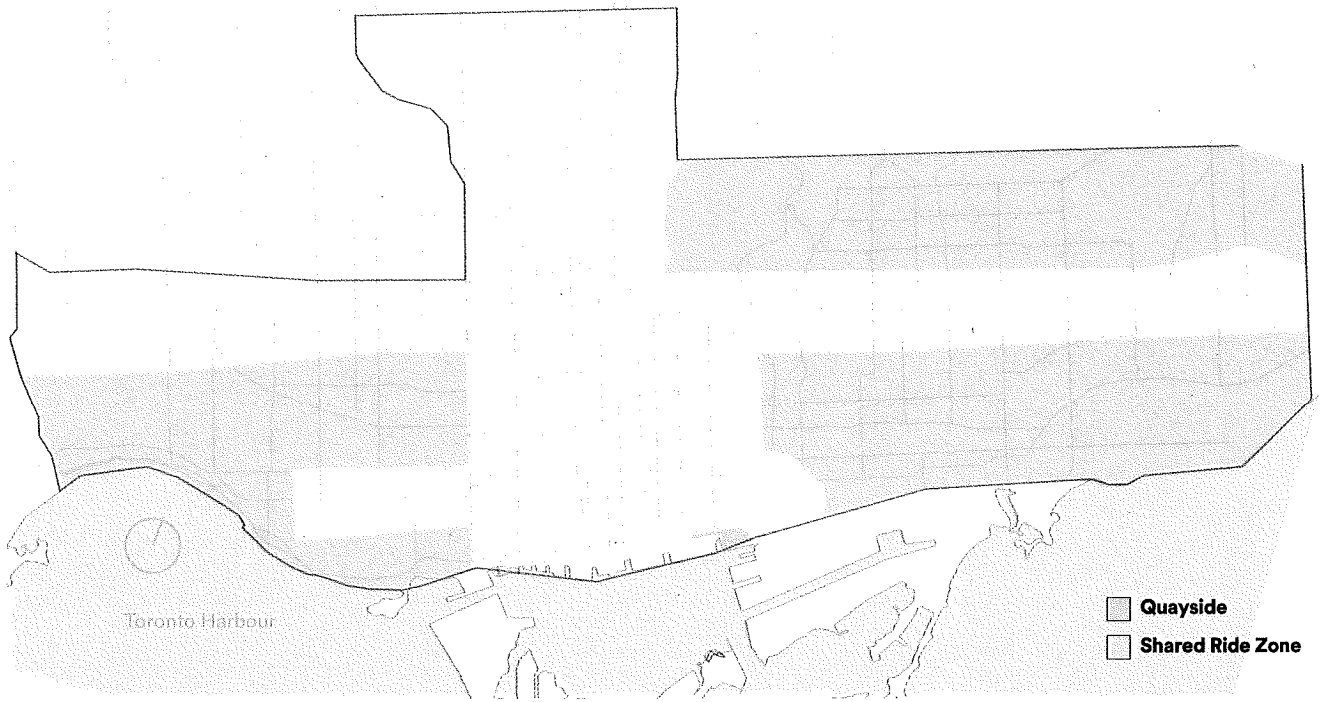
Credit: Zipcar

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## The Power of Shared Ride Services to Replace Driving Alone

Many trips to and from Quayside are likely to involve destinations where there isn't enough volume to justify frequent direct bus or streetcar service, but which are less than 10 kilometers away. Today, driving would be an attractive choice for these trips. Technology offers a great solution in the form of shared ride services—such as Lyft Line, UberPool, and Waze Carpool—through which individual trips can be combined into efficient carpooling trips. In areas where enough trips occur to match trips reliably, shared-ride services can often match the bus service in terms of cost and environmental efficiency.

Sidewalk would also work with employers, retailers, and others at Quayside to offer targeted discounts and subsidies for trips when transit does not offer a high-quality option. The areas where subsidies would be offered would vary by time and day, in response to changes in transit services and demand. Users will choose the best travel mode using mobility as a service, a digital user interface showing travel times and costs for every option. Companies such as TransitApp, Google Maps, and CityMapper all offer this kind of service now, but with limitations; Sidewalk's app will ensure that users are not locked into one interface for all of their trips to and from Quayside.




**For areas of downtown where ridership does not warrant direct new transit service, shared-ride services offer an environmentally friendly and cost-effective approach to high-quality mobility.**

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# Making the Transition at Quayside to Self-Driving Vehicles

THE SELF-DRIVING VEHICLE is the most revolutionary transport technology under development, and it will be a key to making the Eastern Waterfront a global test bed for shared, urban mobility.

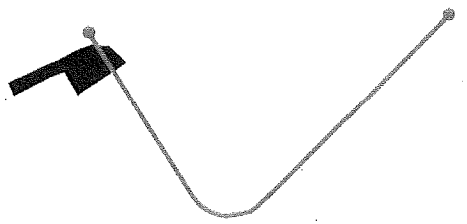
Quayside's intimate size will make it convenient to travel within the site without conventional cars—an ideal place to usher in a transition to a future without them. The street grid will be designed specifically for pedestrians, cyclists, and shared, self-driving vehicles. And the neighbourhood will immediately be open for controlled pilots of self-driving cars, including a shuttle between Quayside and Cherry Beach.

Through the design of the streets and the location of the limited parking that will be available, conventional vehicles will be restricted to a small zone that will serve as a transition, at first, to the rest of Quayside, and, ultimately, to the Eastern Waterfront—the first place in the world where conventional vehicles will be a thing of the past.

## Introducing Self-Driving Technology to Torontonians

Sidewalk envisions testing self-driving shuttles on a route linking the Distillery District, Quayside, Cherry Beach and Tommy Thompson Park during the summer. Such a shuttle would alleviate parking challenges on beach days, while also linking beachgoers to retail and dining opportunities in the Distillery District.

This service would demonstrate the potential and the attractiveness of self-driving technology, and create an attraction in its own right on Toronto's waterfront, emphasizing the area's commitment to innovation.



**Visitors will board an electric self-driving shuttle at the Distillery District to go to Tommy Thompson Park.**

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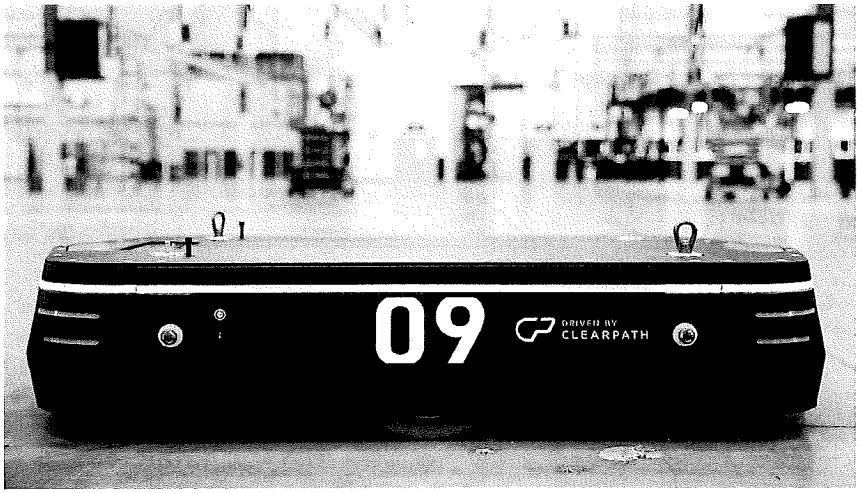
## Getting Stuff When You Want and How You Want: Freight Transit

ClearPath and Amazon's Kiva have demonstrated that robots can effectively move freight in industrial and warehouse settings. The utility channels that Sidewalk plans for Quayside and the Eastern Waterfront would enable the application of this innovation to short-distance, intracity freight. A freight system that operates in the background means fewer trucks on the street, improving the experience of outdoor restaurants, cafes, plazas, and parks.

Pallet-shaped robots will be able to deliver a wide variety of items in standardized containers. At first, the system would deliver the post, which could arrive at a central mailroom; packages would be dropped off in safe, monitored zones (such as resident-only areas) or in digital lockers, located on the street or in common areas, which can only be opened by the intended recipient.

Freight transit would also be made available for the use of Quayside's businesses and residents. This would enable goods transportation 24/7, and the system would also be used to haul solid waste in sealed clear containers.

What is learned at Quayside will inform the reinvention of urban freight on a broader scale on the Eastern Waterfront. Few, if any, deliveries would arrive on traditional trucks; virtually all arriving deliveries would be routed into a consolidation or distribution centre that would sort packages and then distribute them on the underground robot network. Each delivery would be routed according to its level of urgency, perishability, or priority, and additional modes might be employed, such as delivery bikes and aerial drones. The urban freight system would make a significant contribution to reclaiming streets for pedestrians and cyclists with no loss of utility for businesses and residents.







**Powerful, flat-topped delivery robots (such as the one pictured here, developed by ClearPath) can accommodate packages big and small, while sealed containers will mean that delivery of waste or food will be sanitary and dependable.**

Credit: M P Hennessey

**Distribution centres will consolidate deliveries, reducing the number of legacy truck and overall delivery trips in the Eastern Waterfront. The potential exists to make such parcel centres mobile, so they can be loaded in a mailroom and positioned by robot.**

Credit: Lancaster University

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# The Future of Urban Mobility on the Eastern Waterfront

TECHNOLOGY WILL TRANSFORM URBAN MOBILITY ON the Eastern Waterfront, where traditional, privately owned vehicles will be a thing of the past.

Self-driving technology and shared-ride services will combine to create a new kind of transportation network. Functioning more like transit than like taxis today, self-driving vehicles will enable most trips within the Eastern Waterfront, and on key corridors into neighbouring areas, to take place on-demand, point-to-point, with little or no waiting time.

As a fleet of lightweight, highly-efficient vehicles, they will consume little energy; as a fleet of shared-ride vehicles, they will occupy far less space than traditional cars; and as they will be self-driving, the vehicles on the Eastern Waterfront will have fewer accidents, reliably travel at pedestrian-friendly speeds, and give pedestrians and cyclists the right of way at all times.

A ground traffic control system, using sensors to communicate electronically with vehicles, will help the system function efficiently. It will balance travel patterns, guide vehicles around areas with pedestrian traffic, and reallocate street space, as needed, to cyclists and others.

It is important to note that a new neighbourhood on the Eastern Waterfront will benefit immensely from the new Metrolink station proposed for Broadview Avenue, the further extension of streetcars, and the proposed relief line of the subway system. The Eastern Waterfront will also be home to unorthodox forms of transit. Lightweight materials and self-driving technology will combine to create a rapid transit skyway especially suited to crossing the waterways that divide the Eastern Waterfront from downtown. Those same waterways provide the opportunity for the expanded use of ferries at a smaller scale.

Few places in a major city anywhere in the world have as much potential to demonstrate the power of new technology to complement traditional transit and reimagine urban mobility. This transformation will begin in Quayside and be fully realized on the Eastern Waterfront.

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**The possibilities are endless for new mobility solutions on the Eastern Waterfont.**

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# Taxibot Network: A New Form of Urban Transit

SELF-DRIVING VEHICLE USE will be expanded from a shuttle in Quayside into a shared, on-demand taxi service in the Eastern Waterfront. With door-to-door service and negligible waiting times, this "taxibot" system will combine the convenience of private cars and the efficiency of public transit.

Through mobility-as-a-service applications, passengers will be able to choose easily between nodes and will determine their own preferences, such as "ride alone" or "vehicle with roof rack." Passengers will also be able to schedule their travel, ensuring that a ride is always waiting. High-volume routes will be served by multi-passenger self-driving vans (vanbots).

Special features, such as discounted rides for low-income residents, will be enabled by settings on a given user's account and verified through the authentication system, much as a discounted transit pass today is verified by a photo ID. In the same way, employers and retailers may choose to pay for rides for workers and customers, much as restaurants and shops validate parking today.

Sidewalk Labs will work with companies such as Waymo to deploy the baseline fleet of taxibots and multi-passenger vanbots. Existing providers, such as Lyft, would be welcome to enter the market. A key goal of the taxibot system is to use competition to improve user experience, and individuals will be encouraged to include any privately-owned self-driving vehicles in the system as well.




**Shared on-demand services realize the full potential of the autonomous vehicle.**

Credit: DBOX

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# What the Taxibot Means for the Eastern Waterfront

## Safer, More Pleasant Streets

The self-driving taxibot system will increase mobility within the Eastern Waterfront (and other points in Toronto, if allowed), reduce conflicts between cyclists/pedestrians and vehicles, and almost entirely eliminate the need for parking. Shared rides will dramatically cut both total vehicle-kilometers traveled (VKT) and the number of vehicles on the street at any given time, with an associated improvement in air quality and environment.

## Shared Rides Means Fewer Cars

Together with other mobility solutions, taxibots are a critical means to reduce congestion and emissions in the Eastern Waterfront.

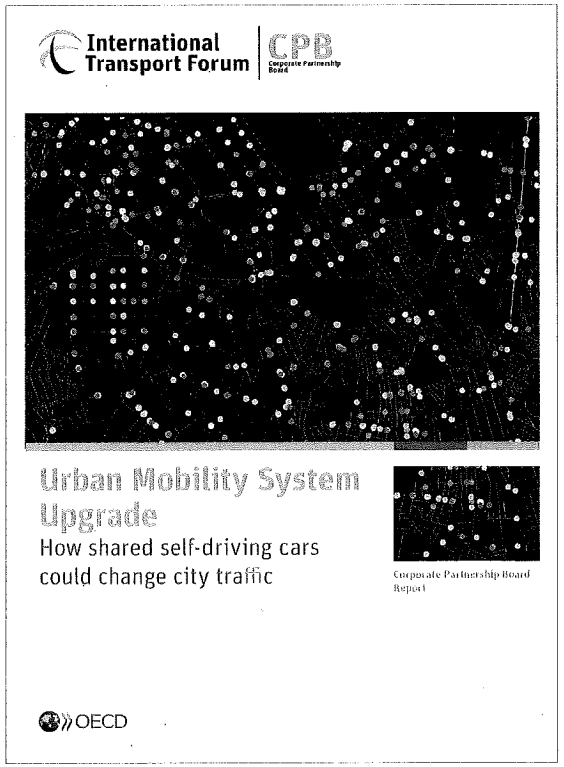
A part of the Greater Toronto Area equivalent in size and comparable density to what Sidewalk envisions for the Eastern Waterfront would have 37,600 private autos; by contrast, the Eastern Waterfront at maturity will require just 1,440 taxibots and 456 vanbots for transit, creating a far more transit-rich and auto-free environment.

| | Greater Toronto Equivalent | Eastern Waterfront Projected |
|---|---|---|
| **Automobiles** | 37,600 Private Cars | 1,440 Shared Taxibots |
| **Local Transit** | 59 Buses<br>8 Streetcars | 456 Vanbots |

## Even Fewer Than Lisbon

The International Transport Forum has conducted some of the most advanced modeling to date on the potential for taxibots and vanbots to remake transportation in an urban context. Their studies of Lisbon suggest a potential reduction of vehicles by 60 percent.

On the Eastern Waterfront, the decline in cars and vehicle kilometers travelled is likely to be far more significant.




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# Taming Urban Traffic: Ground Traffic Control System

MAKING URBAN STREETS FLOW SMOOTHLY and safely is a rarely achieved goal in most densely populated cities.

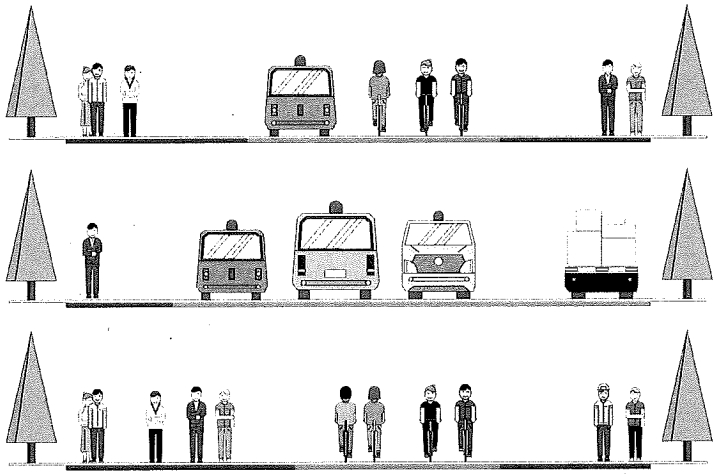
Today, our limited ability to optimize the way the streets work leads to poor performance. Pedestrians are trapped on narrow sidewalks, and crossing times do not adjust for the different needs of different people. Signals do not give priority to cyclists or transit vehicles. And even the smartest traffic signals optimize for an intersection or a corridor, not an entire district.

Sidewalk's vision for the Eastern Waterfront involves a new approach to urban traffic management, one that can draw from an exhaustive set of data inputs to optimize for safety throughput. Termed a ground traffic control system because it mimics the way air traffic control systems function, GTCS will coordinate movement in a way that takes into account the functions, capabilities, and needs of each user.

## Building on Current Efforts

GTCS on the Eastern Waterfront would build on several systems Sidewalk would implement in Quayside. Sidewalk's Semaphore Lab is developing traffic lights that can identify cyclists and pedestrians, and calculate their speeds, to identify when potential collisions might occur and adjust signals accordingly. The efforts on parking management under way by Sidewalk's portfolio company, Flow, will lead ultimately to the ability to track the occupancy of all spaces on the road. Sidewalk's Model Lab is working on advanced, data-driven urban simulations that will enable a comprehensive, dynamic, and real-time traffic optimization to be developed and updated on a constant basis, re-timing signals to serve all users well. And the transportation platform that Sidewalk envisions for Quayside will gather a full picture of residents' travel preferences. Building on these capabilities, in the Eastern Waterfront, GTCS will create a new paradigm for urban transportation management.

## Dynamic Streets That Collect and Respond to Data



**LED lights, embedded in pavement, could enable street allocation to respond to changing needs across the day.**

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## Magnifying the Effectiveness of Urban Mobility Policy

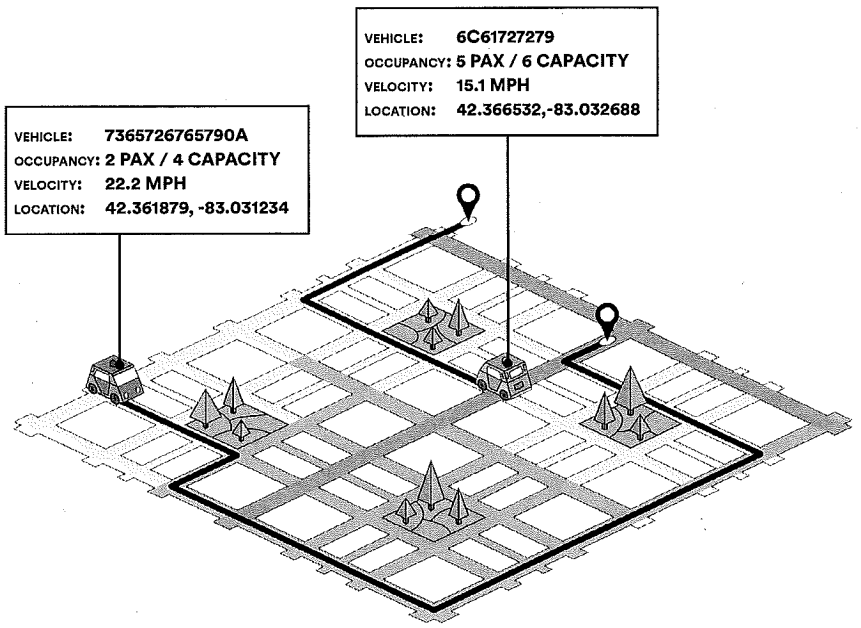
With these capabilities, GTCS would enable a number of powerful transportation policies:

**Put people before vehicles.** The throughput and performance of the urban street system is usually analyzed in its ability to move vehicles, rather than people. With detailed information on uses of the system–including, for example, the number of passengers in a taxibot–GTCS will be able to organize traffic so as to advantage the greatest number of users, rather than vehicles.

**Emphasize reliability over speed.** User research indicates that users value reliability in urban trip times over speed. In other words, trips are considered frustrating when they take 20 minutes one day and 40 minutes the next, while a reliable 30-minute travel time is easy to plan around. By maintaining consistent traffic speeds, even at lower, safer speeds, GTCS can make trips more reliable and predictable for cyclists, drivers, and transit riders alike.

**Enable pricing and other incentives.** While road pricing is a controversial topic in communities across North America, there is no question that incentives are important tools to influence people's mobility choices. GTCS would enable the introduction of a road pricing system that makes sense to travelers. Rather than imposing tolls on a fixed route, or charging vehicles for every kilometer traveled, GTCS would allow charging for specific, congested blocks, varied on a moment's notice, and sent to users immediately. In the context of a self-driving taxibot network, where rides involve some price already, the imposition of a road user charge would be far more acceptable than the imposition of tolls on roads that are traditionally free.

## Real-time Data




**With an understanding of current demand and future demands, the Ground Traffic Control System can dynamically allocate road and curb space as necessary.**

**Available Road Capacity**

- **High availability, Low cost**
- **Medium availability, Medium cost**
- **Low availability, High cost**

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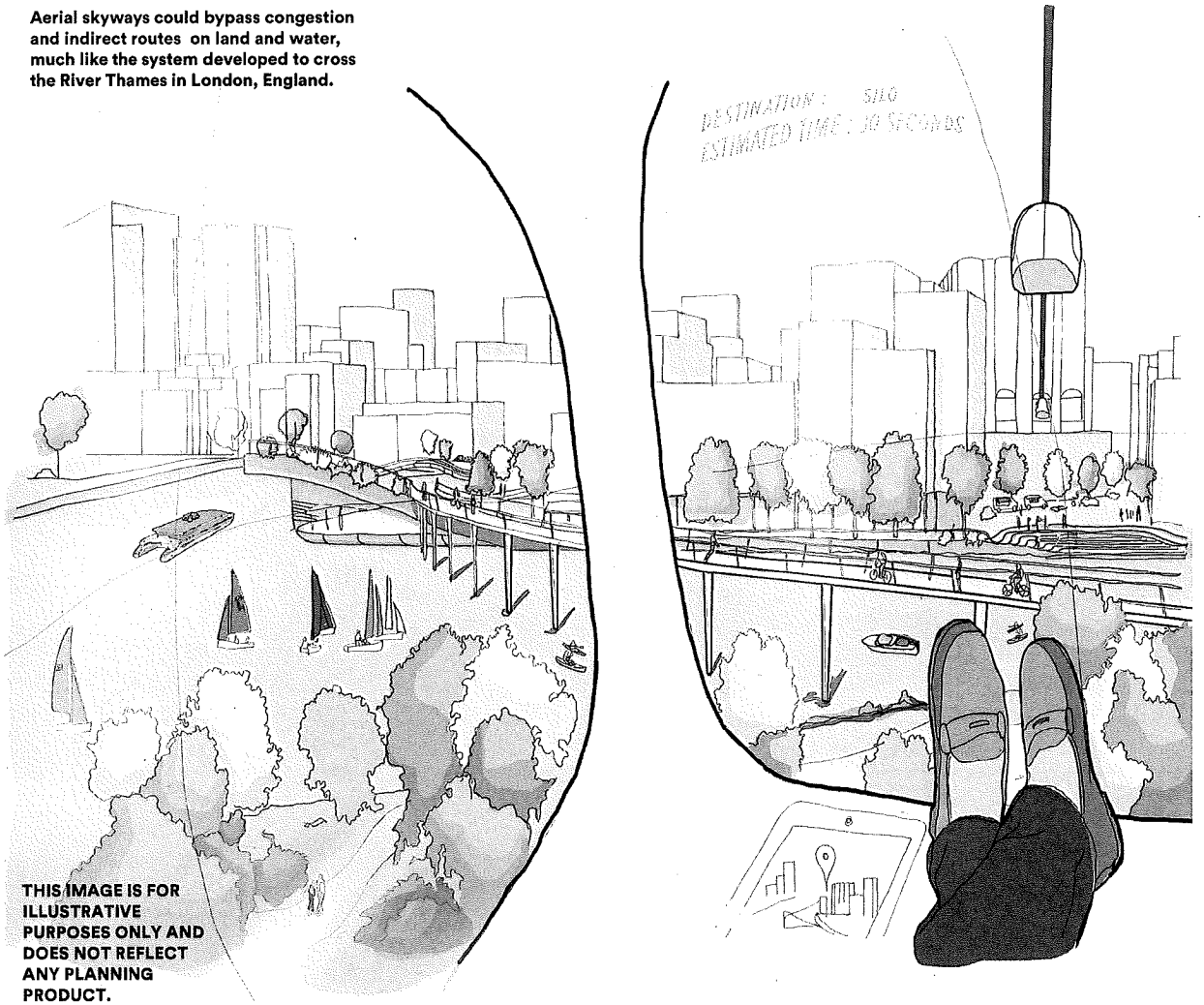
# Thinking Outside and Above the Box

AERIAL TRANSIT HAS LONG BEEN an objective of urban visionaries, beginning with the elevated steam railway of the nineteenth century.

From Rio de Janeiro to London, cities have already adopted the gondola as a way to offer transit, especially across barriers such as water. On the Eastern Waterfront, Sidewalk will pilot a personal rapid transit skyway system. It will combine overhead transport with lightweight vehicles and structures, and technology to make services personalizable.

This could take the form of individually dispatchable gondolas, self-driving pods, such as the Persuasive Electric Vehicle (PEV) under development at MIT, that might be able to travel on land and connect at tower-launching stations to aerial skyway cables or guideways. Advances in battery and material technology might also make it possible for lightweight overhead ramps to carry small-scale, self-driving vehicles as well as bicycles.

**Aerial skyways could bypass congestion and indirect routes on land and water, much like the system developed to cross the River Thames in London, England.**




**THIS IMAGE IS FOR ILLUSTRATIVE PURPOSES ONLY AND DOES NOT REFLECT ANY PLANNING PRODUCT.**

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# Taking Advantage of the Water: High-Speed Ferries

THE EASTERN WATERFRONT WOULD ALSO BE AN ideal place to make use of next-generation ferry service.

While the majority of Quayside's mobility needs will be met by Sidewalk's suite of land-based solutions, ferries will offer valuable service to the larger Eastern Waterfront site. Multiple small docks and smaller ferry vessels will allow "flex service" that deviates from fixed route service. Smaller ferries would also be useful for internal trips within the Eastern Waterfront.

High-speed ferry service from Jack Layton Ferry Terminal could provide a walk/ferry trip between Union Station and the Financial District; and ferry service to Billy Bishop Airport would enhance the district's competitiveness as a business location. New high-speed ferry vessels would be smaller and meet current damage stability criteria set by Transport Canada.




**High-speed ferries could provide competitive travel times between Jack Layton Terminal (shown left), Billy Bishop Airport, and Eastern Waterfront destinations.**

Credit: Mark Wickens




**Thames Clippers River Bus Express, shown right, connects the London Eye and London Bridge Piers to the O2 Arena. The scenic service take 35 minutes and reduces congestion on London's bus and rail networks.**

Credit: O2

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# Roadmap

| | Product Development Strategy: |
|---|---|
| **Ground Traffic Control System** | Sidewalk will determine the existing and new set of data inputs that will enable the GTCS to optimize for throughput and safety. Directed parking and responsive traffic signals will form the basis during early stage development. |
| **Self-driving Taxibots** | Sidewalk will work with manufacturers of self-driving vehicles to identify and test a 6-10-person shuttle between the Distillery District and Cherry Beach, with a target operational date of summer 2018. Toronto-specific conditions will be closely studied, particularly the effect of snow on AV technology. |
| **Personal Rapid Transit** | Sidewalk will initiate discussions with proven firms in the PRT space as well as OEMs of self-driving vehicles. Several pilot projects will be conceived, including testing of new mode types like Persuasive Electric Vehicles (PEVs), so PRT transit options can be made available as soon as Quayside begins to populate. Siting work for aerial towers and cable material investigation will also begin. |
| **Directed Parking** | Sidewalk will partner with leading navigation apps to present parking availability to users. By making the data easily accessible, Quayside residents and visitors will be incentivized to switch modes, reducing congestion related to searching for parking. |
| **Responsive Traffic Signals** | Sidewalk will work with public and private partners to adapt sensor technology and develop computer vision tools that can identify pedestrians, bicyclists, and vehicles. Optimization algorithms will inform signal timing, adjusting to a wide variety of possible situations and edge cases at intersections. |
| **Mobility as a Service** | Sidewalk will either partner with an existing MaaS software provider or will develop the interface envisioned for its MaaS offering in-house. Additionally, Sidewalk will begin to conduct user studies on payment preference, comparing per trip fees to monthly fees. |

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| Quayside Pilot: | Eastern Waterfront Manifestation: |
| --- | --- |
| Sidewalk will incorporate real-time parking availability and road use patterns in Quayside into a standardized data platform. Sidewalk will develop a single interface to measure levels of service across use cases, providing the foundation for a new transportation management system. | Sidewalk will transition the comprehensive "view" of road and parking use into a comprehensive "view and manage" toolkit for officials to monitor and adapt regulation to real-time parking and traffic conditions in the Eastern Waterfront. |
| Sidewalk will use Quayside's pedestrian-only zone as a testing site for self-driving vehicles, and the Cherry Beach shuttle will be a summer feature of the site. Depending on the progress of self-driving technology, self-driving shuttles may begin to connect Quayside with destinations in downtown Toronto, perhaps most logically to mid-Bay Street or the Castle Frank subway station. | The Eastern Waterfront will dedicate most streets for self-driving vehicle-only use, and taxibots will be a major source of urban mobility both within the Eastern Waterfront and to many destinations in downtown Toronto. Parking in the Eastern Waterfront will be dramatically reduced. |
| Sidewalk will pilot several approaches to PRT, soliciting feedback from residents and visitors about mode type and convenience. The findings from Quayside will enable Sidewalk and its partners to design a comprehensive PRT system that will serve the significantly larger population in the Eastern Waterfront. A prototype for aerial cables and towers will begin in Quayside or off-site. | Sidewalk will explore the development of a personal rapid transit skyway system that combines overhead transport with lightweight vehicles and structures. A route from the eastern end of the Eastern Waterfront, through Quayside, into downtown Toronto will be determined. PRT schedules and services will be surfaced to users via the MaaS platform. |
| Through the MaaS platform, Sidewalk will provide customized parking information and pricing to users based on their desired destination and the public transit alternatives to using a private vehicle. Realtime parking management will allow users to "book" time in loading zones in minute increments, increasing throughput and reducing inefficiencies in the parking process. | Roadway and curbside space will be charged in minute increments based on current demand and availability, setting the stage for congestion and usage-based pricing to better manage the network. With the introduction of self-driving taxibots to the Eastern Waterfront, several conventional vehicle parking facilities will transition to serve other uses. |
| Sidewalk will work with the City of Toronto to apply newly developed sensing technology on roads and intersections in Quayside and along Queens Quay. The sensors combined with state-of-the-art computer vision algorithms will generate new data sets on mode split, turn ratio, and analytics, paving the way for advanced signal adaptation. | Sidewalk will work with a car manufacturer or OEM partner to deploy responsive sensing technology to signal controllers for mode-sensitive, real-time traffic control and safety. At the Eastern Waterfront scale, Sidewalk expects to observe quantifiable improvements in throughput and safety. |
| Sidewalk will offer transport options and Quayside-related benefits via multiple MaaS providers, including subsidies for transit, rideshare carpool, bikeshare and carshare programs and information on parking. Quayside users will be able to choose the best trip based on cost, time, and other criteria. | Sidewalk's mobility-as-a-service interface will become the background layer for a taxibot dispatch service. Residents and visitors will benefit from the reliability of the service to get them to their destinations via various transit options. |

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# A Note on Calculating the Environmental Impact of Better Transit at Quayside

ACCOUNTING FOR TRANSPORTATION-RELATED GHG emissions presents the challenge of whether to allocate a trip's impact to its origin or its destination. For a small area such as Quayside, where many trips will leave its boundaries, attributing to the neighbourhood the full emissions of every trip starting or ending in Quayside would overstate its emissions relative to the broader City of Toronto.

To solve this challenge, the relevant protocol for greenhouse-gas accounting offers two approaches.[1] The first is to allocate all trips to the place where the traveller lives. The second is to split each trip's emissions, regardless of trip purpose, between the origin and destination.

While each approach has its merits, Sidewalk has chosen the residential-allocation approach as the more appropriate to Quayside. This is for two reasons: first, because the neighbourhood will have a high proportion of residential use under most plausible programs, and second, because the programs and policies that Sidewalk adopts will likely have greater impact on residents than on workers and visitors. Thus, the residential approach is used in all of Sidewalk's greenhouse gas graphs and statistics.

We have conducted both analyses, and present them both here. Nonetheless, in both Quayside and on the Eastern Waterfront as a whole, the choice of approach to calculating the subset of GHG emissions related to transportation does not significantly change overall GHG performance. Using either approach, with all sources factored in, Quayside approaches but does not quite achieve carbon neutrality, and the Eastern Waterfront achieves Climate Positive performance.

1. Global Protocol for Community-Scale Greenhouse Gas Emission Inventories, pp. 73-78

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## Transport-related GHG Emissions per Capita, Mt $CO^2e$ per Year

| | Residential method | Split-trip method | Discussion |
|---|---|---|---|
| Citywide average, 2013 | 3.00 | 3.00 | |
| Average for Toronto waterfront based on expected auto ownership and travel patterns | 2.18 | 3.11 | Access of site to highways leads to journey to work by auto at a higher rate than Toronto average |
| Change from Waterfront Toronto-compliant transport demand management | -0.36 | -0.52 | |
| Waterfront Toronto expected performance | 1.84 | 2.59 | |
| Change from Sidewalk's mobility strategy for Quayside | -1.42 | -1.03 | Residents' behaviour is more affected by site-specific policies than visitors', particularly in adopting electric vehicles |
| Quayside performance with Sidewalk's strategy | 0.42 | 1.30 | |

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# 5. Technical Appendix

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# Comments on "Toward a Regenerative Waterfront: Quayside Draft Vision Document"

| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Reactivated Waterfront** | | | |
| Target | 30,000 sq ft of arts and culture space | Sidewalk plans to exceed the 30,000 sq ft cultural and artistic space requirement and will bring a mix of cultural uses to the Eastern Waterfront. | A3-C |
| | Live-work targets | In Quayside, Sidewalk will work closely with Waterfront Toronto and local partners to provide a dynamic range of local, independent, and diverse amenities in close proximity to workplaces, meeting live-work targets. | A5-B |
| | 70/30 use-type split | Sidewalk believes that flexible mixed use is better than a fixed-use-type split, which will create a mutually beneficial environment for residents, visitors, and business owners. | A5-B |
| | 20% increase in resident and visitor participation in outdoor installations/areas | In addition to world-class parks and public plazas, innovations like reservable outdoor spaces will help maximize the personalization of public spaces, drawing activities outdoors. | A3-B |
| | >50% tree canopy coverage | Achieving greater than 50% tree canopy may prove difficult to reconcile with other spatial constraints; however, Sidewalk will obtain the benefits of tree canopy coverage through a mix of other types of greenery, physical shading, and stormwater management. | A2-D |
| Strategy | Urban and building design with seasonal variation (emphasis on year-round seasonal activity/winter activation, winter public gardens) | Sidewalk will mitigate uncomfortable weather conditions through physical layout, fixed and movable structures, and tree placement, while preserving the quality of being outdoors rather than indoors. | A3-B |
| | Flexible and seamless indoor/outdoor private amenity space and public space | Sidewalk will work with site planners to ensure that public and private spaces are closely woven together, creating a sense of neighbourhood and community. | A1-C |
| | Experimentation in public space through relaxation of regulations/controls to encourage transient and pop-up interventions (food, drink), micro-spaces, performance, and public artwork | Sidewalk will look to make certain outdoor spaces reservable for an array of short-term uses, such as pop-up shops or seasonal retailers, or even personal events, such as family picnics or school performances, to draw people outdoors. Additionally, Sidewalk is developing a "next-gen bazaar," a maker space with activity stalls that can be refreshed quickly and easily. | A1-C |
| | 24/7 activation with emphasis on evening/night activity available year round | Sidewalk plans to facilitate a vibrant bar, restaurant, and nightlife scene, providing residents and visitors with ample options to celebrate, relax, or socialize. | A3-C |
| | Augmented reality Waterfront Toronto app with interactive information and gamification of participation in the area | Working with Google's Tango technology, inspired by the work of Playable City, and taking advantage of the urban digital platform, Sidewalk plans to experiment with the merger of the physical and digital worlds to improve the neighbourhood experience—without walling people off into their individual virtual worlds. | -- |

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| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Adaptive and Inclusive Place** | | | |
| Target | >30% affordable housing | Sidewalk believes that allocating 20-30% of housing units as affordable is an integral part of any solution, but that it still falls short of a comprehensive, sustainable strategy to deliver mixed-income housing. | A3-A |
| | Certification under International Living Future Institute's JUST program | Sidewalk will seek certification under the International Living Future Institute's JUST program. | -- |
| | Rent capped at an affordable limit or pegged to income (RGI): (1) prices down to 25% of market value (2) rices chosen to be affordable for those earning 30-80% of area median income (AMI) | Sidewalk plans to develop new ways to increase housing affordability, whether through capping rent, providing rental subsidies, or other innovative approaches, but it will rely largely on the legal and financial agreement reached between Sidewalk, Waterfront Toronto and the relevant government agencies. | A3-A |
| | 30,000—50,000 sq ft of adaptable use types | Sidewalk plans to meet these requirements through the flexibility enabled by the Loft building typology. | A3-A |
| | Mix of at least three different use types in single building/development | Radical mixed-use buildings combined with outcome-based code will ensure that multiple uses can coexist safely. | A3-A |
| Strategy | New formula to set affordable target prices based on market trends | Sidewalk's Investment Team will work with Waterfront Toronto to create innovative approaches for both the rental and residential markets. | A3-a |
| | Innovative affordable ownership program | A partial homeownership program, such as Options for Homes, might be a perfect fit for a family looking to settle down for the long run, whereas a retiree on a fixed income may require a rental subsidy. | A3-A |
| | Flexible land use and zoning permissions and built form/building types to allow multiple uses over the lifecycle of a building/community | New predictive modeling techniques and real-time monitoring can enable a shift to outcome-based building code. The outcome-based system would require buildings (regardless of use) in an area to conform to a series of safety and quality-of-place metrics that would be measured in realtime. | A3-A |
| | Provide full mix of housing types and tenures for multiple generations in single buildings/ development, with opportunity to adapt unit over lifetime | Sidewalk's Loft concept improves upon traditional loft buildings by planning explicitly for ongoing and frequent interior changes around a strong skeletal structure. Its structure would remain flexible over the course of its lifecycle, accommodating a radical mix of uses (such as residential, retail, making, office, hospitality, and parking) that can respond quickly to market demand. | A3-A |
| | Local food and employment strategy | Sidewalk will work with Waterfront Toronto to create a proposed set of standards for local food procurement and employment within the site. | -- |

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# Comments on "Toward a Regenerative Waterfront: Quayside Draft Vision Document"

| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Food Forward** | | | |
| Target | Community farming/garden space available to all residents | Sidewalk will endeavour to offer residents garden space within the site to invigorate the community. | -- |
| | Two acres of land reserved for agricultural uses | Two acres of land will have to be balanced against other desirable uses for land, but Sidewalk is eager to work with Waterfront Toronto and its team to ensure ample opportunities for urban agriculture in creative ways. | A2-D |
| | 100% of residents will have access to food grown within the district | At the Eastern Waterfront scale, a measurable amount of onsite agriculture may be feasible, but Sidewalk also believes that Quayside should be fully integrated into the regional food and agriculture system of the Toronto area. | -- |
| | Every resident within a five minute walk of a fresh food market | Sidewalk's concepts for flexible public space and flexible buildings should make it easy for greengrocers, farm stands, and other forms of fresh food providers to flourish throughout the neighbourhood. | A3-C |
| | Invest 2% of annual profit in sustainable food R&D fund | At this time, Sidewalk is unable to make specific commitments to a sustainable food R&D fund, which will depend on the nature of the financial partnership between Waterfront Toronto and Sidewalk, however Sidewalk is interested in working with WT to support sustainable food practices. | -- |
| Strategy | Community gardens and agricultural farming (both horizontal and vertical) | Sidewalk's concepts for flexible buildings and flexible public space uses should enable a desirable mix of these approaches to emerge organically. | A3-c |
| | Food business incubators/co-working | Sidewalk would be enthusiastic about including food start-ups as part of the start-up ecosystem Sidewalk hopes to foster at Quayside and on the Eastern Waterfront. | -- |
| | Pop-up restaurant / food prototype labs | Sidewalk's flexible building and public space concepts will be highly conducive to the emergence of experimental and temporary restaurants and food prototype labs. | A3-C |
| | Salvage grocers selling "uglies" and items that are past sell-by | Sidewalk will explore ways to encourage the sale of "uglies" in the site, and will seek to gather and redistribute useful waste in all forms as part of a holistic waste management program. | -- |
| | Mobile app connects residents to locally sourced food delivery and to food sharing services to reduce food waste | Sidewalk's vision for a Neighbourhood Assistant application will facilitate collaboration and sharing of many forms, including food sharing; Sidewalk's vision for a freight transit system will also make food and meal deliveries within the site easier. | A3-C |

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| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **High Performance Buildings** | | | |
| Target | Architecture 2030 Challenge (site EUI)—see details | Sidewalk shares the same ideals of the Architecture 2030 challenge and is committed to planning and designing cities, towns, developments, and buildings to low-carbon/carbon-neutral standard. | -- |
| | Green roof to cover 80% of available roof space | To satisfy Waterfront Toronto's target of 10% onsite power generation, Sidewalk estimates that 50% of roofs will need to be outfitted with solar PV, but the remaining 50% of roofs will be green roofs. Through material choices, storm-water management approaches, and public realm design, Sidewalk expects to realize most of the cooling and water retention benefits of green roofs. | A2-A |
| Strategy | Passive House design standards | For overall energy consumption, Sidewalk will plan to use the Passive House standard as a baseline. With a cluster of Passive House—inspired buildings, Quayside will have the potential to serve as a laboratory for the refinement of this standard to North American multifamily buildings. | A2-A |
| | All-electric buildings | As the centrepiece of a new approach to building energy at Quayside, Sidewalk will pilot a local thermal grid that taps multiple existing sources of energy for circulation and reuse for heating and cooling. Quayside will rely on its own microgrid with on-site renewable generation and the main grid for its electricity needs. As a result, the only fossil fuels used on the site are likely to be at the thermal grid energy centre as a rarely used backup supply, and potentially for cooking fuel. | A2-B |
| | Building level wastewater heat recovery | Sidewalk has incorporated sewer heat recovery into its thermal grid plan; whether the best scale for wastewater heat recovery is at the building or neighbourhood scale must be explored. | A2-B |
| | Database and platform for public sharing (open source) of development-wide building energy data | Sidewalk will develop clear data standards and a well-supported APIs so building energy data can be analyzed by anyone interested. | A1-F |
| | Smart grid laboratory with connected apartments | Sidewalk plans to outfit smart meters and controls in all buildings, which will be used to help manage the microgrid. | -- |

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# Comments on "Toward a Regenerative Waterfront: Quayside Draft Vision Document"

| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Zero Carbon Energy** | | | |
| Target | 100% fossil fuel free | Through a sustainability strategy centred on thermal energy capture, Quayside has the potential to be nearly climate positive in its early phases, and the Eastern Waterfront can achieve climate-positive status—demonstrating a new frontier of urban climate innovation. | A2 |
| | Net exporter of energy | The scale of the Eastern Waterfront makes it possible to incorporate massive sources of heat and cool into the system from Lake Ontario, the Portlands Energy Centre, and Ashbridges Bay Wastewater Treatment Plant, exporting significant thermal energy to the rest of the city and achieving climate-positive performance. | A2 |
| | 10% renewable energy production by cost (LEED v2009 3 points) | Sidewalk expects to generate 10 to 15% of electricity supply with 50% PV coverage and the potential use of biogas (biomethane). | A2-A |
| | Net Zero buildings or Net Zero adaptable by 2025 | Sidewalk plans to achieve Net Zero buildings on an aggressive timeline. | A2-B |
| Strategy | Leverage existing, or develop further, zero-carbon district cooling and heating infrastructure (biomethane, hydrogen, natural gas, biomass, lake cooling, etc.) | Sidewalk plans to leverage sewage heat recovery, biomethane and geoexchange in Quayside. At the Eastern Waterfront scale, Sidewalk also plans to leverage lake source cooling, as well as waste heat from the Portlands Energy Centre and the Ashbridges WWTP. In both sites, natural gas boilers will be used for resilience purposes only. | A2-b |
| | Building scale waste-to-energy gasification | While Sidewalk is open to exploring all innovative technology, Sidewalk's current understanding is that building scale waste for energy gasification may be uneconomical because it will require a high level of presorting and a syngas engine. | -- |
| | Power-2-Gas hydrogen storage system to store carbon-free electricity at night for use during the day | Sidewalk has incorporated onsite battery storage into the advanced microgrid concept, and is open to a variety of types of battery technologies. However, Sidewalk's current understanding is that power-2-gas storage is problematic because electrolysis is typically net negative, as it tends to use more electricity than it produces. | -- |
| | Testbed for a range of energy generation and storage technologies new to market (e.g., glass-2-energy, hybrid hydrogen/solar panels, solar paint, carbon nanotubes) | Sidewalk is committed to encouraging innovation to more quickly realize Waterfront Toronto and Sidewalk's sustainability goals. Sidewalk anticipates piloting facade solar and other technologies as practicable. | A2 |
| | Smart metering (smart grid) and control software to intelligently optimize energy production, to buy and sell energy to/from the grid, and to educate the public | There is limited experience in the marketplace with true multi-source district thermal systems, so Sidewalk expects to innovate around management software, ideally with a partner who has deep expertise in central thermal systems. Similarly, most microgrids have limited software and controls capability, so Sidewalk will partner and/or develop solutions to manage the two-way flow of electricity in real time. | A2-B |

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| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Total Connectivity** | | | |
| Target | Minimum 80% reduction to regional average transport-related CO2 emissions/person | Sidewalk expects to meet this standard by encouraging non-personal automobile travel through pedestrian and cyclist-friendly infrastructure, new transit services (electric AV shuttles, pending extension of the 501 and 514 streetcars) and subsidy policies (e.g. transit pass for residents). | A3-B |
| | Minimum 80th percentile access to transit and access to destinations (particularly jobs) score relative to Union Station | Sidewalk has proposed a multifaceted mobility strategy, which involves AV shuttles and the extension of the 501 and 514 street cars, dynamically dispatched shared rides (such as Lyftline), and connections to major cycling routes. If implemented, Sidewalk expects to approach or meet this standard. | A3-B |
| | Achieve all transport-related LEED Neighbourhood Development (ND) prerequisites and 90% of credits available, and platinum-standard for transport variables under other LEED rating systems | Sidewalk expects to meet all LEED ND prerequisites and 90% of credits available. | -- |
| | Walkscore, Transitscore and Bikescores ≥95 | Sidewalk expects to meet Walkscore, Transitscore, and Bikescore ratings of 100 based on our concepts for site layout and our mobility strategy. | -- |
| | Exemplar AV and EV-ready development for Toronto including all residential tenant parking being wired for recharging | Sidewalk plans to work with site planners to identify ideal locations for EV charging stations and will engage with AV manufacturers to ensure the site has necessary infrastructure for rapid AV deployment. | A3-B |
| Strategy | Autonomous shuttle scheme to supplement access to transit | Sidewalk hopes to pilot a self-driving shuttle between the Distillery District and Cherry Beach even before Quayside is developed. On the Eastern Waterfront, this can evolve into a next-generation autonomous transit system that provides point-to-point convenience without the safety risks and high costs of private cars. | A3-b |
| | Test-bed for autonomous vehicle trials (electric) | Working in partnership with Sidewalk's sibling company, Waymo, and perhaps others, Sidewalk would seek to use the Eastern Waterfront as a place to test two types of self-driving vehicles: a small personal vehicle and a 6—12 seat vehicle to provide shuttle service to Cherry Beach Park. | A3-B |
| | Install multipurpose infrastructure including self-lit, photovoltaic pedestrian and cycling surfaces | Sidewalk will pilot flexible space allocations using embedded LED lights, enabling a temporary bike lane to become a pedestrian laneway on demand. | A3-B |
| | 'Next gen' real-time transit displays incorporating available capacity and travel time estimates | Sidewalk envisions real-time transit displays that surface announcements, delays and capacity; Intersection, a Sidewalk portfolio company, already provides these displays for the MTA in New York City. | A3-B |
| | Sensors to measure traffic, transit, emissions and/or pedestrian flows and generate real-time data in order to measure and test the impact of various initiatives | Sidewalk would pilot a mix of current and advanced sensor technologies (in development through its Semaphore Lab) that detect not only cars but also cyclists and pedestrians, collecting data that can be analyzed for a myriad of purposes, such as safety and traffic flow optimization. | A3-B |

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# Comments on "Toward a Regenerative Waterfront: Quayside Draft Vision Document"

| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Zero Waste** | | | |
| Target | 100% construction waste recovered | Material innovations, combined with off-site prefabrication, enable more eco-friendly developments that can reduce or eliminate construction waste. | A2-A |
| | Zero operational waste to landfill | Sidewalk expects to divert more than 80% of operational waste, working toward 100% diversion. | A1-E |
| Strategy | Automated (vacuum) waste collection system (e.g., Envac) with sensors | While a vacuum system is a promising solution, Sidewalk sees even greater benefit in using industrial robots to move solid waste to a central point through open utility channels. By putting waste into standardized containers that robots can move, neighbourhoods can adhere to the current three-bin approach (organics, recyclables, and landfill) while creating flexibility to accommodate any change in the sorting regime. | A2-b |
| | Building- or district-scale waste-to-energy (e.g., anaerobic digestion, gasification, pyrolysis, etc.) | At Quayside, Sidewalk plans to include an anaerobic digester at the central point to consume the neighbourhood's organic waste. Sidewalk would also pursue a similar strategy in the Eastern Waterfront. | A2-B |
| | Waste collection, processing, and energy generation from the wider Toronto area in order to be waste positive | At the scale of the Eastern Waterfront, Sidewalk will seek an onsite material recovery facility and perhaps some form of advanced waste-to-energy facility for the remainder. | A2-B |
| | Expansion of circular economy thinking with local manufacturers | Sidewalk will engage local manufacturers on circular economy concepts, devising pilot projects where appropriate, if it is determined to be a priority by Waterfront Toronto in the context of the overall project. | -- |
| | Extended Producer Responsibility (EPR) | Sidewalk would be pleased to work with producers of goods and materials to identify areas to shape the behaviour of consumers and producers to help eliminate waste, if it is determined to be a priority by Waterfront Toronto in the context of the overall project. | -- |

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| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Material Innovation** | | | |
| Target | Adoption of the Living Building Challenge Materials Petal or LEEDv4 Platinum | Sidewalk plans to achieve the LEEDv4 Platinum standard, especially given Sidewalk's focus on Passive House standards. | A2-A |
| | Timber structures for low-to-mid-rise buildings (remove regulatory barriers, fund testing of mass timber) | Sidewalk intends to experiment with timber structures, which offer both sustainability and cost benefits. | A2-A |
| | Meet LEEDv4 Low-Emitting Materials requirements for all building products and furniture | Sidewalk is committed to exploring a variety of new materials to reach the LEED standard, such as Shikkui plaster and a non-formaldehyde wood adhesive. | A2-A |
| | 50% reduction of whole building embodied carbon | Despite challenges in accurately measuring whole-building embodied carbon, Sidewalk will consider embodied carbon and plans to incorporate advanced and natural materials. | -- |
| | 100% FSC-certified wood | Sidewalk is eager to adopt a target of using 100% FSC-certified wood, pending an analysis of availability and other potential constraints. | A2-a |
| | Vegetated, high-albedo, or permeable surfaces on all hardscape | Sidewalk plans to integrate vegetated and permeable surfaces on all hardscapes. | -- |
| | 1% of construction budget set aside for materials, systems, or method innovations for all building and infrastructure projects | Sidewalk expects that its aggressive agenda for building innovation will easily allow it to reach this target. | -- |
| Strategy | Bio-based product innovations (mycelium, laminated structural bamboo, jute/flax-based FRP) | Sidewalk has already done work involving mycelium and Shikkui plaster as new, bio-based building materials, and is eager to continue this work and apply it in Quayside. | A2-a |
| | Facades Innovation (algae facades, photosynthetic glass) | Sidewalk plans to develop facade-based solar and facade insulation strategies to achieve Passive House and LEED standards. | A2-A |
| | Titaniumdioxide coatings on exterior surfaces (hardscapes and facades decompose air pollutants when exposed to UV radiation) | Sidewalk is actively researching photocatylic materials, such as Shikkui plaster, which cleans the air. | A2-A |
| | Policy requiring DfD and RFID/information tagging on reusable components | Sidewalk will explore approaches to tagging reusable components, if it is determined to be a priority by Waterfront Toronto in the context of the overall project. | -- |
| | Setting embodied carbon targets for buildings and maintaining database for benchmarking | Sidewalk plans to set and monitor embodied carbon targets from a building performance perspective, however Sidewalk recognizes that there are significant challenges in monitoring from a construction material perspective. | A2-A |

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# Comments on "Toward a Regenerative Waterfront: Quayside Draft Vision Document"

| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Water Positive** | | | |
| Target | Net positive water | Sidewalk does not believe it will be feasible to make Quayside water positive; doing so would require on-site blackwater treatment, which is unlikely to be economical. However, Sidewalk's plans envision a thorough approach to providing purple-pipe water to all units. | A2-B |
| Strategy | Onsite wastewater treatment of building wastewater for non-potable water use—excess supply exported off-site (e.g., greywater or blackwater systems) | Sidewalk would plan to incorporate a "purple-pipe" nonpotable water feed into each building's system, which helps renters and apartment dwellers reuse water, dramatically reducing energy-intensive treatment needs. | A2-B |
| | Rainwater harvesting and treatment for potable water use—excess supply exported off-site | Sidewalk is eager to incorporate rainwater capture strategies into building and public realm design. Whether this water is treated on-site, used as nonpotable water, or treated at a central plant will depend on technological and economic feasibility. | A2-B |
| | Sewer mining of municipal collection system to increase non-potable water supply | While Sidewalk would be eager to explore onsite rainwater capture and treatment for potable uses, the Ashbridges Bay Wastewater Treatment Plant could easily supply the entire Eastern Waterfront (including Quayside) with nonpotable water, which would greatly simplify the water supply system and eliminate large amounts of energy-consuming treatment equipment at the building scale. | A2-B |
| | Smart water fixtures (toilets and hot/cold faucets feed information into the BMS) | Sidewalk will outfit all buildings with smart water fixtures to ensure best management of water usage, flagging abnormal or above average activity to appropriate parties. | -- |
| | Submetering with connection to visualization dashboard | Sidewalk will combine cloud software, sensors, and controls into a new "active stormwater management" system that will reduce the size and cost of future stormwater infrastructure needed in the Eastern Waterfront. | -- |

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| Goal | | Sidewalk's Responses | RFP Ref |
|---|---|---|---|
| **Healthy Lifestyles** | | | |
| Target | WELL Community—a Vanguard Pilot Project | Sidewalk is eager to incorporate the WELL community standard into its site planning; Sidewalk's approach to public space, active mobility, and innovative materials already incorporates many of its objectives. | -- |
| | WELL Building Standard Gold or Platinum Certification for a proportion of buildings | Sidewalk is eager to work towards Gold or Platinum WELL Building certification for a proportion of the buildings on Quayside. | -- |
| | Site-wide Biophilia Plan (e.g., 14 patterns of Biophilia —for indoor and outdoor use) | Sidewalk's visions for the site, especially with regard to attracting people outdoors, making nature visible, and designing around the water aspect of the site all embrace the concepts of biophilia. Sidewalk would be pleased to work with Waterfront Toronto toward a formal biophilia plan, if it is determined to be a priority by Waterfront Toronto in the context of the overall project. | -- |
| Strategy | Biophilic design strategy | Sidewalk will work with site planners and Waterfront Toronto on a comprehensive biophilic design strategy, if it is determined to be a priority of Waterfront Toronto in the context of the overall project. | -- |
| | Healthy materials strategy (also linked to Material Innovation Category) | Sidewalk has a track record of working with advanced, healthy, bio-based materials, and is eager to work with Waterfront Toronto towards a strategy for their use. | A2-A |
| | Digital platform / app promoting activity, healthy eating, relaxation, and connection to the environment | Sidewalk's overall digital strategy includes capturing a variety of data and facilitating residents' and others' uses of that data through existing and new applications. | A1-F |
| | Real-time sensors and transparency in operational data | Sidewalk will implement a core urban data platform governed by open standards and will open a well-designed, well-documented, and well-supported APIs to third-party developers. | A1-F |
| | Online platform/app for expressing views and being heard | At Quayside, Sidewalk will pilot an application called Neighbourhood Assistant to facilitate social coordination and public feedback. This platform enables Quayside residents to form new neighbourhood groups, crowd-source community needs, and access a peer-to-peer marketplace. | A1-C |

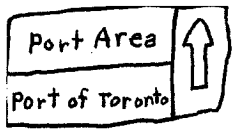
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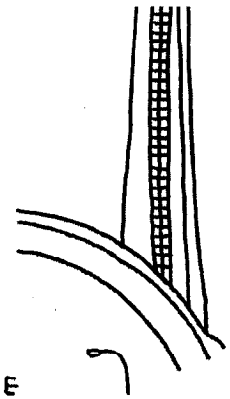
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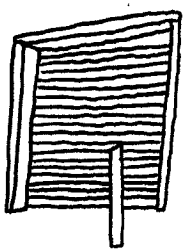
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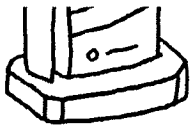


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SILO DOOR & YELLOW POLE ON CHERRY STREET

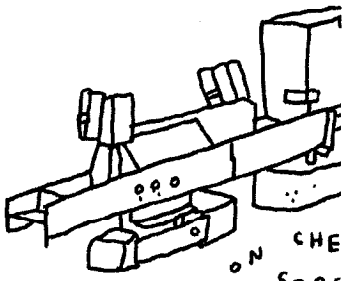
TWO WAVES AT SIMCOE WAVE DECK



METROLINX PRESTO KIOSK PAY STATION IN UNION STATION

FLAT SIGN ON CHERRY STREET





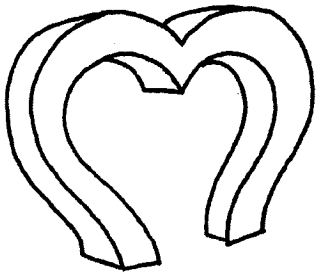
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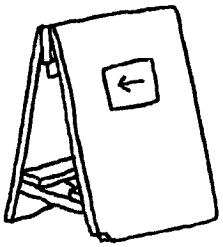
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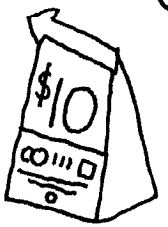
LITTLE GIRL IN TUNNEL BETWEEN AIRPORT & TORONTO

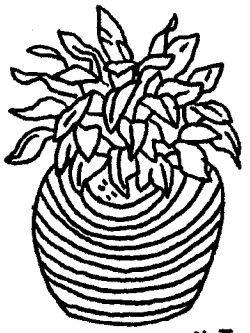


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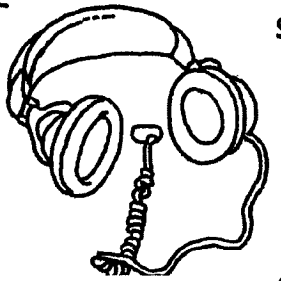
HEART IN THE DISTILLERY DISTRICT



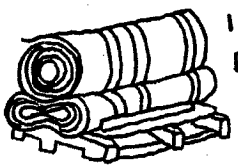
BILLY BISHOP TORONTO CITY AIRPORT FERRY



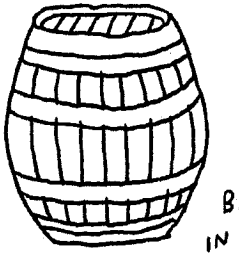

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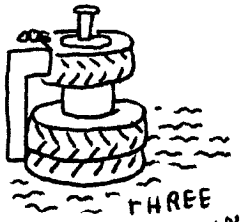
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BARREL IN THE DISTILLERY DISTRICT



THREE TIRES IN THE WATER AT CHERRY STREET

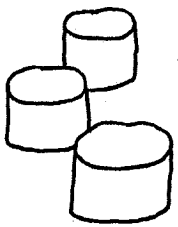


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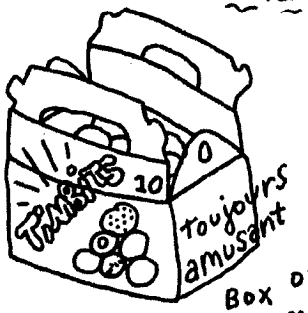
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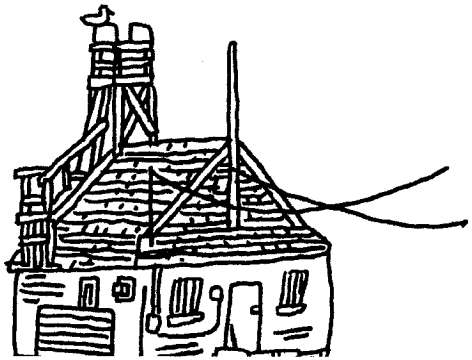
THREE SEATS IN CANADA SQUARE AT HARBOURFRONT CENTRE




BOX OF TIMBITS AT TIM HORTONS



CHEF IN RESTAURANT



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STREET

Blue Jays Wy

QUEEN STREET WEST

SKATEBOARDER IN BERCZY PARK

SEAGULL (PLUMP)

Go-Karts

SIGN BEHIND T&T SUPERMARKET ON POLSON

PRACTICE COURT

TWO YAMS AT T&T SUPERMARKE

RAY
ET

TORONTO

FIREMAN GETTING A COFFEE ON KING & SPADINA

IE

T OF HEADPHONES AT THE POWER PLANT

CENTRE

MAN & WOMAN TAKING PICTURES ON THE ROD ROBBIE BRIDGE

A LEMON AT LOBLAWS

BACK OF A DRIVE-IN MOVIE SCREEN IT'S GREEN ON CHERRY JUST ABOVE THE

STRAUSS TRUNNION BASCULE BRIDGE ON THE FAR SIDE OF A GOLF DRIVING RANGE

TRAFFIC LIGHT IN FRONT OF CHERRY STREET BAR-B-QUE

WINDOW OF THE ROSALIE SHARP PAVILIO AT ONTARIO COLLEGE OF ART & DESIG ON MCCAUL STREET

PUSH BUGGY OFF MOVATOR

SIGN AT LOBLAWS

KENSINGTON

Lee Valley

Tools for Life™

BIG JAR OF PEPPERS AT PARTS & LABOUR IN PARKDALE

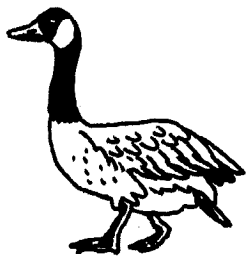
TREE IN TOMMY THOMPSON PARK

WINDOW WASHER ON KIN STREE

ST. ANDREW JUST OFF SPADINA

EDGE

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*February 5, 2018*

# Terms of Reference
Draft

## Quayside Executive Steering Committee (QESC)
Toronto Waterfront Revitalization Initiative

**Background:**

As approved in the 2017-18 Corporate Plan, Waterfront Toronto issued a competitive Request for Proposals for an Innovation and Funding Partner to help create and fund a plan for a globally-significant community. This project is intended as a testbed -- engaging citizens, civic, academic and Canadian business organizations -- to showcase advanced technologies, building materials, sustainable practices, and innovative business/funding models than can achieve a healthy, diverse and climate positive urban development.

Sidewalk Labs was chosen as the successful proponent as Waterfront Toronto's Innovation and Funding Partner. Together, Waterfront Toronto and Sidewalk Labs will join with citizens and other partner entities to develop a Master Innovation and Development Plan (MIDP) over the next 12-18 months. The MIDP will be subject to review by Waterfront Toronto's Board and its shareholder governments, as well as Sidewalk Labs' Board and the relevant government regulatory authorities.

**Proposed Coordination Entity:**

The Quayside Executive Steering Committee is intended to provide tri-government project-level oversight and coordination for the Quayside initiative. The Committee will be convened by Waterfront Toronto and include representatives from Sidewalk Labs, the City of Toronto, the Province of Ontario and the Government of Canada.

**Role and Responsibilities:**

The Quayside Executive Steering Committee will be the project-level oversight and coordination vehicle for reviewing, evaluating and providing input on the following:

1. Plan Development Agreement (timeline and budget);
2. Valuation Methodologies (including approaches for land valuation, acquisitions, and disposition; infrastructure systems, delivery and funding; and participation in technology platforms that provide data/support to infrastructure systems and vertical buildings; and
3. Master Innovation and Development Plan.

The Quayside Executive Steering Committee will be the organizing entity to:

1. Review initial pilot projects before proposals are formally submitted to approving government regulatory authorities;
2. Monitor and refine the public and stakeholder engagement plan;



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3. Identify input on approval pathways for proposed project innovations;
4. Provide input on procurement protocols for WT assets;
5. Provide input and direction on procurement protocols for assets outside of WT's purview;
6. Review spending against identified budget;
7. Review proposed milestones and schedule;
8. Review and provide input on project-related risk management protocols;
9. Provide additional coordination with other non-Waterfront Toronto capital projects;
10. Refer policy and/or unresolved issues to the IGSC; and
11. Review on going reports on project performance.

The Quayside Executive Steering Committee may delegate aspects of this work to the Project Delivery Team.

**Chair:**

The responsibility of the chair will be shared on a rotating basis after each meeting between interested members.

**Membership:**

The Quayside Executive Steering Committee will be comprised of the following:

- Waterfront Toronto: President and CEO;
- [redacted]
- Government of Ontario: TBD;
- Government of Canada: TBD;

Representatives of political offices (e.g., Toronto Office of the Mayor) will be invited to participate in meetings.

Quayside Executive Steering Committee meetings will be attended and supported by senior project manager staff/directors from each participating organization that is part of the Project Delivery Team.

**Project Delivery Team and Administrative Support:**

The Project Delivery Team will be comprised of Waterfront Toronto and Sidewalk Labs staff who will deliver the project and will include senior project manager staff/directors from other participating organizations and key consultants and contractors.

Waterfront Toronto will be responsible for drafting records of discussions, following up on decisions and actions, disseminating information, distributing meeting documentation, scheduling meetings and logistical arrangements, as required.



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**Dispute Resolution:**

[redacted]

**Meetings:**

Quayside Executive Steering Committee meetings will be convened every six (6) weeks. The schedule of meetings will be established by its members and meetings will be held in-person or by teleconference.

Agendas and agenda materials are to be prepared by the Project Delivery Team, with review of the City's Waterfront Secretariat and circulated one week in advance.

**Reporting:**

The Quayside Executive Steering Committee will prepare and circulate a covering memorandum and meeting minutes to the IGSC within two weeks after each Quayside Executive Steering Committee meeting. The covering memorandum will summarize key issues, and most importantly, flag any matters that may require the IGSC's attention.

**Term:**

The Quayside Executive Steering Committee shall exist and operate until the approval or disapproval of the Master Innovation and Development Plan. This Terms of Reference shall be revisited and updated by the Quayside Executive Steering Committee and IGSC members if the Quayside Project goes forward beyond the MIDP stage.



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**Page(s) 411 to 415**
**are exempted**
**pursuant to paragraph**
**13(1)(c), 21(a), and 21(b)**
**of the *Access to Information Act***

****

**La/les page(s) 411 à 415**
**Font l'objet d'une exception totale**
**conformément aux dispositions de paragraphe**
**13(1)(c), 21(a), et 21(b)**
**de la *loi sur l'accès à l'information***

# Quayside

## Innovation & Funding Partner RFP
## Waterfront Toronto Board of Directors

October 16, 2017

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# Agenda

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## Part 1: Proponent Selection

## Part 2: Governance and IREC Oversight

## Part 3: Framework Agreement

## Part 4: Key Risks Addressed



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# Purpose

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## Purpose of this meeting is:

1. To consider and, if appropriate, approve the proposed Framework Agreement for the Quayside Innovation and Funding Partner pursuant to Request For Proposals 2017-13 between Waterfront Toronto, Sidewalk Labs LLC and Sidewalk Toronto LP.

2. To authorize Management to execute the Framework Agreement and undertake the work contemplated in it.



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# Part 1: Proponent Selection

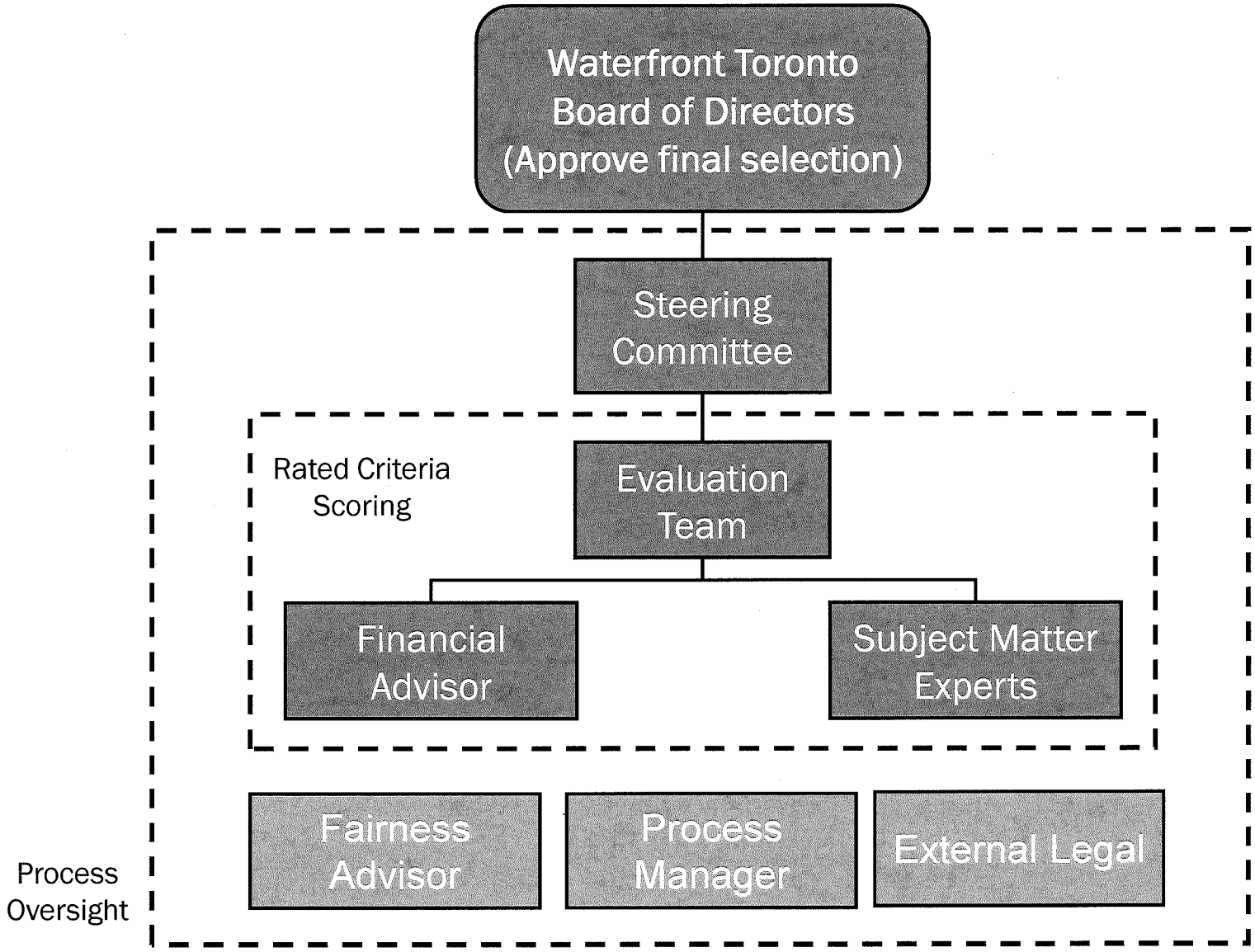
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# Extensive Evaluation Process and Oversight

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# Sidewalk Reason for Involvement

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1. **Technology Venture Capital** - Sidewalk intends to invest in companies to help grow the urban innovation cluster in Toronto which will provide returns to Sidewalk Labs.

2. **Downstream Real Estate Business Model** – Sidewalk may participate in returns on downstream land dispositions to vertical developers as Waterfront Toronto's innovation and funding partner. Or Sidewalk might be permitted to buy a piece of land to develop a unique project using technologies that cannot be sourced from the market such as the modular affordable housing.

3. **Infrastructure Investment** – To the extent Sidewalk is able to deploy certain infrastructure in the waterfront, user fees could be collected to offset costs.



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# Part 2: Governance – IREC Oversight

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# Governance – IREC Oversight

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- Quayside is a significant project for the Corporation.
- IREC's mandate includes overseeing the evaluation and implementation of significant projects and opportunities.
- IREC involvement in Framework Agreement: 8 meetings covering term sheet, negotiations and key risks.



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# Part 3: Framework Agreement

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# Timeline Towards a Working Partnership

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**Stage 0**
- Framework Agreement
- Q4 2017

**Stage 1**
- Initial Definitive Documents
- Q1 2018

**Stage 2**
- Initial Plan Milestones
- Q2 2018

**Stage 3**
- Master Innovation & Development Plan
- Subsequent Definitive Documents
- Q4 2018

Waterfront Toronto is at the beginning of an extensive, year-long multi-stage process to develop a business plan for an innovative and sustainable project with Sidewalk Labs.

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# Stage 0: Framework Agreement

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## Executive Summary

1. The Framework Agreement is best understood as an ***"agreement to agree."***

2. It establishes a ***timeline and budget*** for the parties to advance the vision presented in Sidewalk's RFP into an actionable, concrete business plan and proposal, the "Master Innovation and Development Plan."

3. The Framework Agreement does not fully define certain key commercial terms (land valuation, procurement, governance, etc.). Rather it ***provides principles*** that are meant to inform more substantive development agreements. These terms will be defined through the business plan.

4. The Framework Agreement provides ***multiple off ramps*** to both parties and ***Sidewalk bears the financial risk*** if future agreement can not be achieved.



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# Stage 1: Initial Definitive Documents

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## Initial Definitive Documents:

1. Plan Development Agreement
    - Will detail a unified planning approach and establish the roadmap by which Waterfront Toronto and Sidewalk Labs will prepare the Master Innovation and Development Plan

2. Development Plan Budget
    - A budget agreed upon by both Waterfront Toronto and Sidewalk Labs that will provide for anticipated expenses for Stages 1 and 2
    - Sidewalk Labs will cover all of Waterfront Toronto's expenses

## Associated Funding:

Sidewalk Labs, at the beginning of Stage 1, will start to release the Initial Capital Commitment of $10 million, as needed, to facilitate the completion of the above Initial Definitive Documents



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# Stage 2: Initial Plan Milestones

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## Initial Plan Milestones

1. Flood Protection Contribution Agreements Executed
2. Reaffirmation of Waterfront Toronto's Mandate
3. Agreement on Scope of Business and Implementation Plan
4. Agreement on Scope of Master Innovation and Development Plan
5. Fair Procurement Standards Established



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# Stage 3: Master Innovation & Development Plan

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1. **Master Innovation and Development Plan (MIDP)**
   - MIDP will be developed collaboratively between Waterfront Toronto and Sidewalk Labs based on the vision and aspirations set out by Sidewalk's RFP submission.
   - The MIDP will detail the plans, pilots and development sequencing for Quayside, while informing future plans for the Eastern Waterfront.
   - Waterfront Toronto's Board will have the opportunity to approve the MIDP.
2. **Implementation Documents**
   - Additional definitive documents and structures will be created during the MIDP phase to allow for implementation upon approval by Waterfront Toronto's Board.

**Associated Funding**

Upon completion of the Initial Definitive Documents and the Initial Plan Milestones, Sidewalk Labs will fund the First Contingent Commitment of $40 million to complete the MIDP and the Subsequent Definitive Documents



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# Part 4: Key Risks Addressed

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# Key Risks Addressed

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1. Framework Agreement and RFP – Framework Agreement within scope of RFP (Lalonde, Dentons).

2. Partnership structure –partnership structure deferred to next stage.

3. Termination rights and liability – Framework Agreement has sufficient termination rights, limiting liability for Waterfront Toronto (Macintosh, Dentons).

4. Approach to Eastern Waterfront – Framework Agreement envisions a 12-month planning exercise with no rights to land at this time.



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# Key Risks Addressed (cont'd)

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5. Land valuation – methodology deferred to next stage.

6. Fair Procurement for downstream processes – Initial principles of Fair Procurement included in Framework Agreement. Additional refinement during Plan Development Agreement and Master Innovation & Development Plan stages.

7. Role of Alphabet – Alphabet has provided a comfort letter regarding the $50m. Sidewalk Labs LLC will execute Framework Agreement to ensure link to Alphabet.



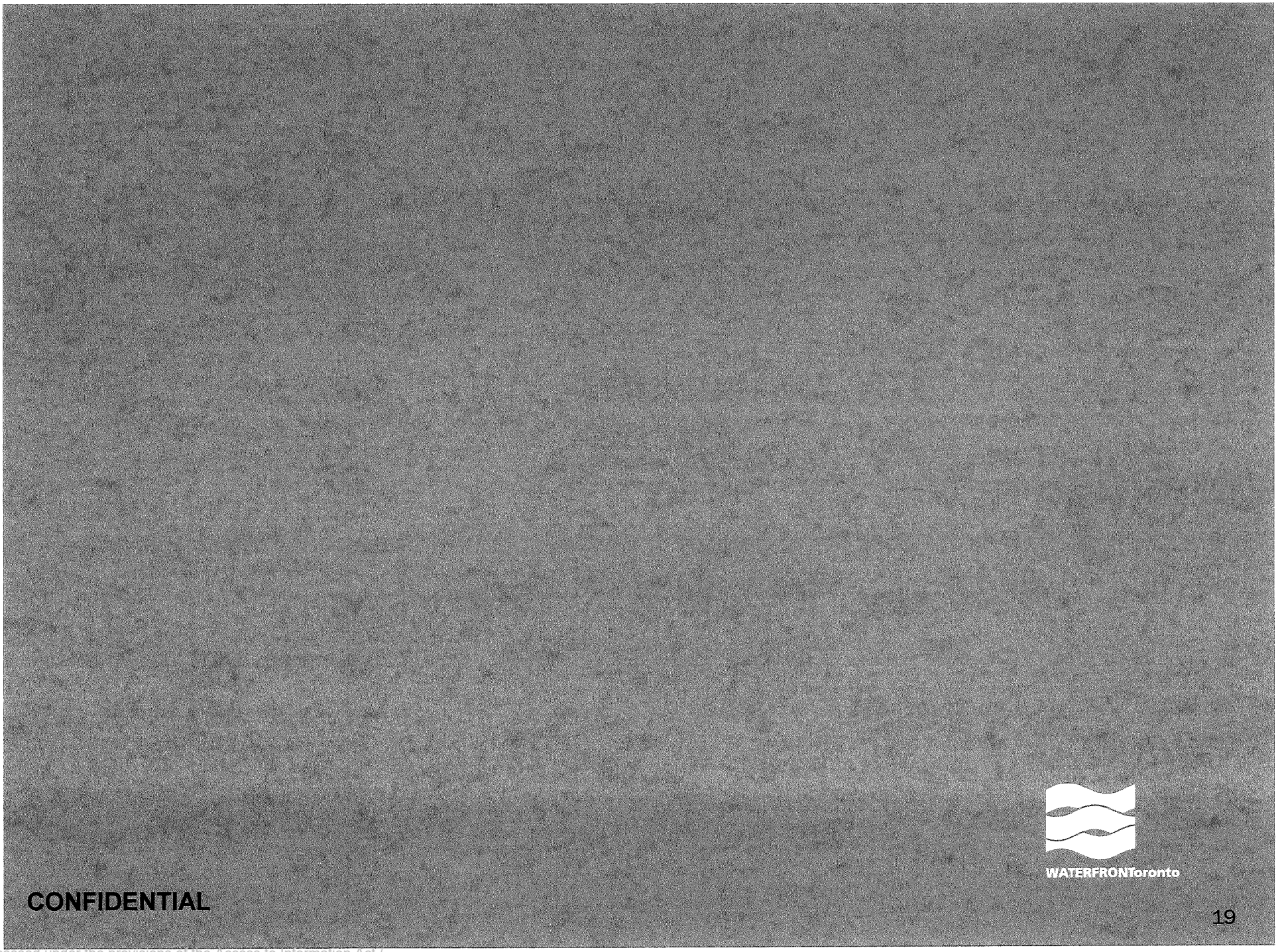
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# Questions & Discussion

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# Back up slides

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# Recommendation

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The Evaluation Team recommended, and the steering committee subsequently approved, that Sidewalk Labs be formally selected as the preferred proponent to move forward into negotiations as Waterfront Toronto's Innovation and Funding Partner for the Quayside Project:

SIDEWALK LABS



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# The Challenges to be Addressed by Quayside

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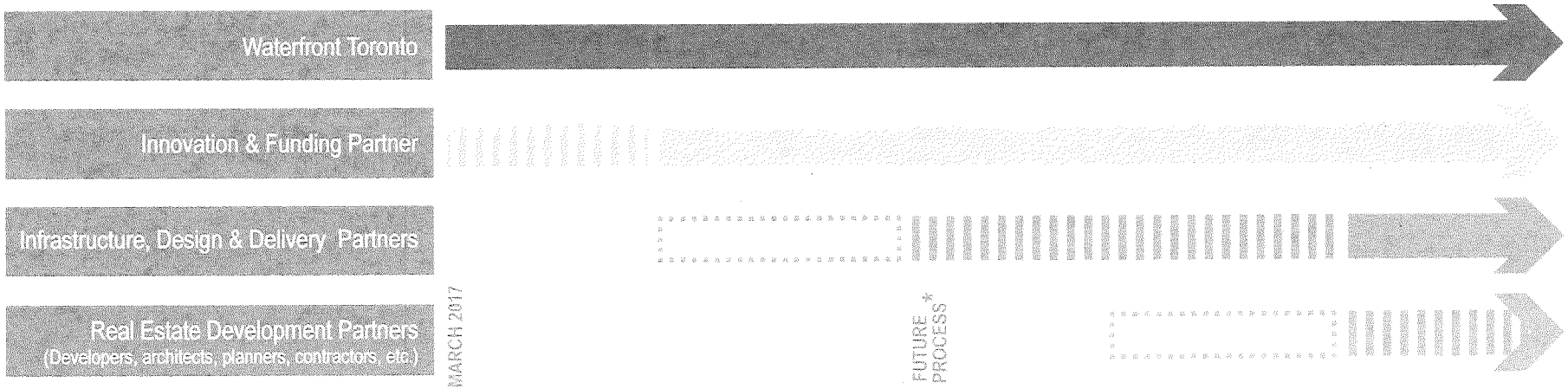


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# Future RFPs

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## The Innovation and Funding Partner RFP is the first in a series:






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# A Robust Selection Process

WATERFRONToronto

## Quayside RFP Timeline

| Milestone | Date |
|---|---|
| Steering Committee Meeting # 1 | February 14, 2017 |
| RFP Released | March 17, 2017 |
| Bidders Meeting (Optional) | March 30, 2017 |
| First Round Submissions Due | April 27, 2017 |
| Evaluation Meeting | May 12, 2017 |
| Steering Committee Meeting # 2 | May 17,2017 |
| Shortlist Notification | May 19, 2017 |
| Shortlist Commercial Confidential Meetings (4 rounds) | May 29 – August 11, 2017 |
| Best and Final Offer (BAFO) Submissions Due | August 22, 2017 |
| Evaluation Meeting – BAFO | August 30, 2017 |
| Steering Committee # 3 | September 11, 2017 |
| Preferred Proponent Notification | September 11, 2017 |
| Negotiations with the Preferred Proponent | September 19 – October 8, 2017 |



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# A Robust Selection Process

WATERFRONToronto

## Board & Committee Timeline

| Meeting & Materials | Date |
|---|---|
| **Board Meetings** | |
| • Quayside+ concept Introduced as an approach to achieving scale | December 12, 2016 |
| • CEO report | February 10, 2017 |
| • CEO report | April 20, 2017 |
| • CEO report | June 13, 2017 |
| • CEO report | September 14, 2017 |
| • Consideration & Approval | TBD |
| **IREC Meetings** | |
| • Introduction of Quayside+ concept | November 24, 2016 |
| • Draft RFP | February 1, 2017 |
| • Draft Generic I&FP Term Sheet | June 21, 2017 |
| • Sidewalk Labs Initial Term Sheet | September 13, 2017 |
| • Negotiation Advice & Proponent Presentation | September 19, 2017 |
| • Negotiation Advice & Process Update | October 4, 2017 |
| • Special IREC Meeting re: Process | October 10, 2017 |
| • Consideration & Approval | October 12, 2017 |
| **Additional Information** | |
| • Steering Committee* Meeting (IREC invited to observe) | September 11, 2017 |

**Note: Susie Henderson served as the IREC representative on the Quayside Steering Committee.*



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# Extensive Evaluation Process and Oversight

WATERFRONTToronto

## Steering Committee

- **Purpose:** Due diligence, review and, if necessary, challenge work of Evaluation Team
- Members of Waterfront Toronto Executive Team and Board of Directors, external subject matter experts
  - Paul Bedford, Former Chief Planner City of Toronto & Chair, Waterfront Toronto Design Review Panel
  - Valerie Fox, CEO, The Pivotal Point
  - Peter Halsall, Executive Director, Canadian Urban Institute
  - Susie Henderson, Waterfront Toronto Board Member & IREC Representative
  - Will Fleissig, President & CEO Waterfront Toronto (Chair)
  - Meg Davis, Chief Integration Officer, Waterfront Toronto
  - Marisa Piattelli, Chief Strategy Officer, Waterfront Toronto



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# Extensive Evaluation Process and Oversight

WATERFRONToronto

## Fairness Advisor

- Hon. Justice Coulter Osborne

## Procurement Lawyer, Paul Lalonde, Dentons

- Advice on the RFP documentation and process

## Waterfront Toronto Procurement

- Kevin Newson, Director
- Betty Leung, Senior Procurement Manager
- Nancy Wong, Procurement & Contracts Assistant

## Waterfront Toronto Legal

- Ian Beverley, General Counsel



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# Extensive Evaluation Process and Oversight

WATERFRONTToronto

## Evaluation Team

- **Purpose:** Score submissions according to pre-established evaluation criteria in RFP

### Waterfront Toronto Staff Members

- Aaron Barter, Innovation & Sustainability Manager
- Erik Cunnington, Director, Development (Co-lead)
- Christopher Glaisek, Senior Vice President, Planning & Design
- Julius Gombos, Senior Project Director
- Angela Li, Development Finance Manager
- Kristina Verner, VP Innovation, Sustainability & Prosperity (Co-lead)
- Carol Webb, Manager, Project Communications

### External Subject Matter Experts

- Amanda Smith, Canadian Urban Institute, Sustainability & Resilience
- Michael Drayton, KPMG, Financial Strength & Capacity
- Will Lipson, KPMG, Financial Strength & Capacity



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# 1. Termination Rights and Liability

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There are a number of opportunities for WT to exit the deal:

1. **Plan Development Agreement (approximately 3 months):** If WT does not approve and agree to sign, the deal is terminated without penalty to WT

2. **Master Innovation and Development Plan (approximately 12 months):** Again, WT can decide not to approve the MIDP and exit without penalty and still benefit from site specific IP

3. Anytime: Additionally, WT can exit anytime until the MIDP is approved without penalty

4. Implementation phase – After the approval of MIDP, exit ramps will be negotiated as part of the ongoing transaction documents

**Sidewalk Labs has committed to fund the operational costs for the completion of the plans and documents contained in Stages 1, 2 and 3 at a cost of up to $50 million, to be paid out as per the agreed upon budget and timelines. This is Sidewalk Labs' at risk capital for which they will have no recourse should this agreement be terminated.**



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# 3. Approach to Eastern Waterfront

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1. The Proponent is fully aware of the limits of Waterfront Toronto's authority within the Port Lands:
   - Business Implementation Plan
   - Reaffirmation of the 2006 MOU
   - Council Approval

2. The Framework Agreement is clear that the Proponent does not have any rights to the land, but will be permitted to work with Waterfront Toronto on the vision/planning of the Eastern Waterfront.

3. Waterfront Toronto has received a legal opinion that the Framework Agreement is within the scope of the RFP:

   *Waterfront Toronto considers that by achieving key objectives for the Project it may be beneficial to advance the solutions, processes and partnerships proven successful through the Project to subsequent developments on the eastern waterfront, as those lands become available to Waterfront Toronto (as per the established protocols with the City of Toronto). As the directing agency of the waterfront lands, Waterfront Toronto, therefore, reserves the right to do so. The extent to and the manner in which such successful solutions, processes and partnerships are carried forward into subsequent developments of the eastern waterfront could be affected by future applicable procurement policies and additional requirements of the City of Toronto or other funding authorities.*



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# 4. Land Valuation and Disposition Methodology

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- The Land Valuation Methodology will be negotiated in upcoming stages.
- There are a number of financial incentives that will come to Waterfront Toronto.
- Preliminary land purchase price considerations:
    - Based on fair market value, subject to considerations regarding contributions to capital and infrastructure
    - Floor price will be established in the Plan Development Agreement (Stage 1)
    - Opportunity for upside participation

**Fair market value will be established through an agreed approach in the Plan Development Agreement (Stage 1) and implemented in the Implementation Agreements (Stage 3). Additional financial incentives will be articulated in the Plan Development Agreement (Stage 1).**



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# 5. Fair Procurement

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1. Ensuring open procurement policy with regard to technology and infrastructure, including standards-based architecture

2. Determining how to validate and procure solutions that "can not be sourced from the market"

3. Waterfront Toronto has received a legal opinion on an approach to Fair Procurement that will serve as the basis of negotiations with Sidewalk Labs

**An initial approach to Fair Procurement will be included as a principle in the Framework Agreement (Stage 0). Additional refinement will be conducted during the negotiation of the Plan Development Agreement (Stage 1). The final policy will be included in the Master Innovation & Development Plan (Stage 3). The Implementation Agreements (Stage 3) will be governed by this policy.**



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**MEETING OF THE BOARD OF DIRECTORS**
**OF THE TORONTO WATERFRONT REVITALIZATION CORPORATION**
TO BE HELD AT 20 BAY STREET, SUITE 1310, TORONTO, ONTARIO, M5J 2N8
**ON WEDNESDAY, NOVEMBER 15, 2017 AT 2:30 P.M.**

# Public Session Agenda

| | | | | |
|---|---|---|---|---|
| 2:30 p.m. | **1.** | **Motion to Approve Meeting Agenda**<br>Review and approval of meeting agenda | Board | Approval |
| 2:35 p.m. | **2.** | **Declaration of Conflicts of Interest**<br>An opportunity for Board Members to disclose any conflicts with regard to agenda items | Board | Declaration |
| 2:35 p.m. | **3.** | **Motion to go into Closed Session** | Board | Approval |

# Closed Session Agenda

The Board will discuss the matters outlined below in a closed session as permitted by By-Law No.2 of the Corporation and Section 190 of the City of Toronto Act ("COTA"). The exception relied on for the discussion of Item #4 in Closed Session is Section 190(2)(c) of COTA and Section 6.1.1(c) of By-Law No. 2 which is that the discussion will concern a proposed or pending acquisition or disposition of land. The meeting will continue in Open Session following the conclusion of the Closed Session discussion.

| | | | | |
|---|---|---|---|---|
| 2:40 p.m. | **4.** | **Project Governance Discussion** | Board | Discussion |
| 4:55 p.m. | **5.** | **Motion to go into Open Session** | Board | Approval |
| 4:55 p.m. | **6.** | **Motions Arising from the Closed Session (if any)** | Board | Approval |
| 4:55 p.m. | **7.** | **Motion to Adjourn the Meeting** | Board | Approval |

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**Proposed Motion**

**ON MOTION** duly made, seconded and carried, be it RESOLVED that the meeting now continue in Open Session.

After passage of the above motion, it is appropriate to invite members of the public to rejoin the meeting.

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**Board Meeting – November 15, 2017**

# Item 6 – Motions Arising from the Closed Session

**Board Members**

Any resolutions arising from the Closed Session will be tabled for consideration by the Board Members.

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**ON MOTION**, duly made, seconded and carried, be it **RESOLVED** that the meeting be and is hereby terminated.

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| | |
|---|---|
| **Agenda Item** | Item 8d)- Quayside Committee |
| **Purpose** | Approval by the Board of Directors of the Mandate for the Quayside Committee as prepared by the Committee and attached. |
| **Key Message** | At the October 27, 2017 meeting of the Board of Directors, the Board established the Quayside Committee and directed the Quayside Committee to develop its mandate and protocols for the governance and oversight of the Quayside transaction, including a communications strategy, and to report back to the board for approval of such mandate and protocols at the next regularly scheduled meeting of the Board of Directors in December. |
| **Areas of note/ Key issues** | The Quayside Committee met to review the Mandate on November 27 and on December 1. The Committee approved the Mandate in the form attached on December 1 and recommends the Mandate to the Board of Directors for approval at the December 7, 2017 Board Meeting. |
| **Expected Outcome** | Approval of the Quayside Committee Mandate by the Board of Directors:<br><br>**Proposed Motion:** Moved by Moved by (name of proposer) and seconded by (name of seconder) that the Board of Directors approves the Mandate for the Quayside Committee as tabled. |
| **Key Takeaways/ Next Steps** | As above. |

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**TORONTO WATERFRONT REVITALIZATION CORPORATION**

# Quayside Committee Mandate

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## 1. Role and Responsibilities

The role of the Quayside Committee (the "**Committee**") is to assist the Board of Directors (the "**Board**") of the Toronto Waterfront Revitalization Corporation (the "**Corporation**") in fulfilling its oversight responsibilities with respect to Quayside Matters (as defined below).

### (a) Quayside Matters

The Committee will provide strategic review and advice for recommendation to the Board on:

(i) the arrangement(s) with or relating to the Innovation and Funding Partner ("IFP") selected by the Corporation under Request for Proposals 2017-13 ("RFP") as is appropriate and necessary to develop a successful relationship including government and public relations strategies and any other strategies, contractual agreements (and the Framework Agreement and the role of the IFP thereunder), procurement strategies, privacy protocols, land valuation methodology, data management strategies, joint staffing and funding of work by the Corporation related to the Master Innovation and Development Plan;

(ii) any transactions or potential transactions or business arrangements directly or indirectly involving or relating to the IFP concerning the Quayside Property (as referred to in the RFP); and

(iii) any other transactions or potential transactions directly or indirectly involving or relating to the IFP concerning any other lands or any other matter;

which are referred to collectively hereinafter as "Quayside Matters".

### (b) Governance Framework and Protocols

The Committee will provide strategic review and advice for recommendation to the Board on appropriate governance framework(s) and protocols for oversight of Quayside Matters (the "Governance Framework and Protocols"). Without limitation, the Governance and Framework Protocols will address:

(i) communication with government and other stakeholders and reporting to and seeking Board approval;

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(ii) the process to select third parties to be engaged in connection with Quayside Matters.

(c) **Acquisitions and Divestitures**

For greater certainty, the Committee will review and evaluate for recommendation to the Board acquisitions and divestitures relating to the Quayside Property or to Quayside Matters or to any business arrangements proposed by the Corporation's management as required by the Governance Framework and Protocols.

(d) **Core Principles/Risk Management**

The Committee will:

(i) provide strategic review and advice concerning core principles and activities relevant to this Mandate; and

(ii) Oversee any risk related tasks assigned to it by the Board's Finance, Audit and Risk Management Committee.

(e) **Assessment**

The Committee will, as and when desirable or necessary, and at least annually, review this Mandate and the performance of this Committee in relation to the Mandate.

**2. Authority**

(a) The Board authorizes the Committee to:

(i) Carry out its responsibilities as set out in this Mandate;

(ii) Require management and employees of the Corporation and any others it deems to have relevant experience and expertise, to attend, or participate in, its meetings and proceedings; and

(iii) Communicate expectations and the nature, timing and extent of the Committee's informational needs to management.

(b) The Committee may, in cooperation with the Board's Finance, Audit and Risk Management Committee, direct the external or internal auditors to examine or consider a specific matter or area or to perform a supplemental review or audit.

**3. Composition and Procedures**

(a) The Committee will be appointed by the Board or as the Board directs and will be composed of no fewer than three Board Directors. The Committee will be chaired by a person or persons appointed by the Board (the "**Committee Chair**" or

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"**Committee Co-Chairs**" as the case may be). The Corporate Secretary of the Board will be the Secretary of the Committee.

(b) Each member will serve at the pleasure of the Board and will cease to be a member upon the termination of Board service.

(c) The Board may fill vacancies in the Committee. If a vacancy exists on the Committee, the remaining members may exercise all Committee powers so long as a quorum remains.

(d) The Committee will meet as frequently as may be required.

(e) The Committee Chair or Committee Co-Chairs or any two members of the Committee may call meetings.

(f) Unless waived by all members, notice of each meeting of the Committee confirming the date, time, place and agenda of the meeting, together with any supporting materials, must be given to each member at least two (2) business days before the date of the meeting.

(g) The Committee Chair or Co-Chairs, in consultation with the Chair where appropriate, shall review and approve the agenda for each meeting of the Committee as proposed by management.

(h) A quorum for a meeting of the Committee is a majority of members present in person or by teleconference. In the absence of the Committee Chair or Committee Co-Chairs, the other members of the Committee may appoint one of their members to chair the meeting. The Committee Chair or Co-Chairs or any substitute chair may vote on any matter, but will not have a second or casting vote.

(i) The powers of the Committee may be exercised at a meeting where a quorum is present.

(j) The Chair of the Board or a Board member, if not a member of the Committee, may attend any meeting of the Committee in an ex-officio capacity and will not vote.

(k) The Chief Executive Officer will be invited to all meetings of the Committee.

(l) The Secretary of the Committee will prepare and keep minutes of each Committee meeting. Minutes will be available to each Committee member and to any other Director who may properly request them.

(m) The Committee Chair or Co-Chairs will report to the Board, as appropriate, following meetings of the Committee.

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